W. WRIGHT.

INDIVIDUAL LETTER PRINTING MACHINE.

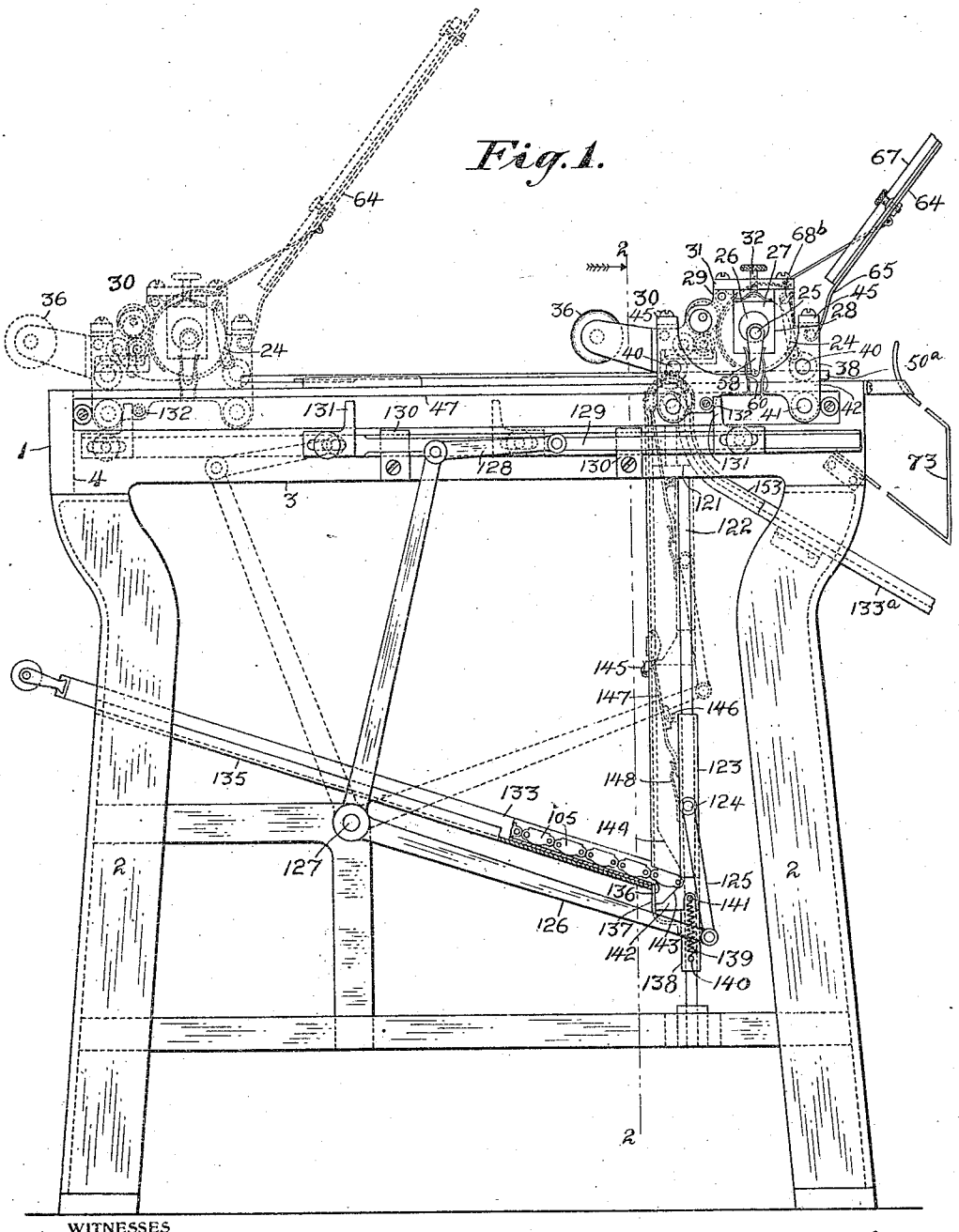
APPLICATION FILED NOV. 13, 1908.

1,179,489.

Patented Apr. 18, 1916.

7 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

F. C. Fliedner

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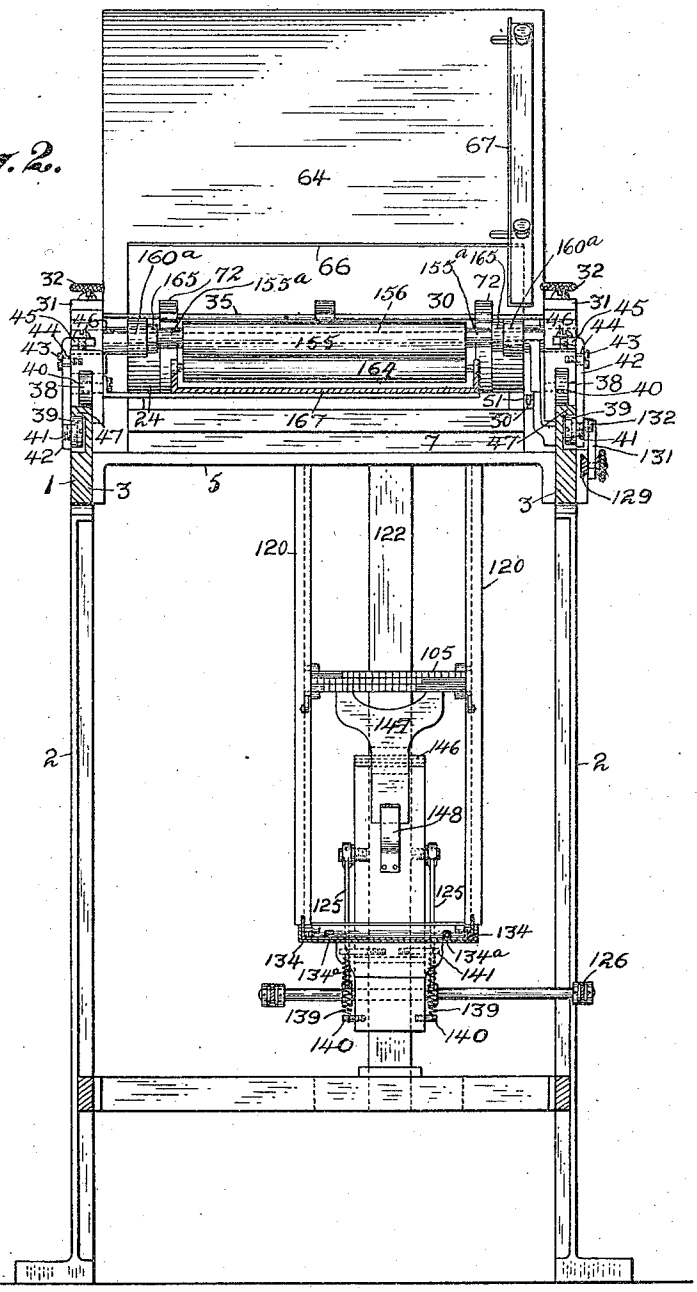
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7 SHEETS—SHEET 2.

Fig. 2.



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7 SHEETS—SHEET 3.

Fig. 3.

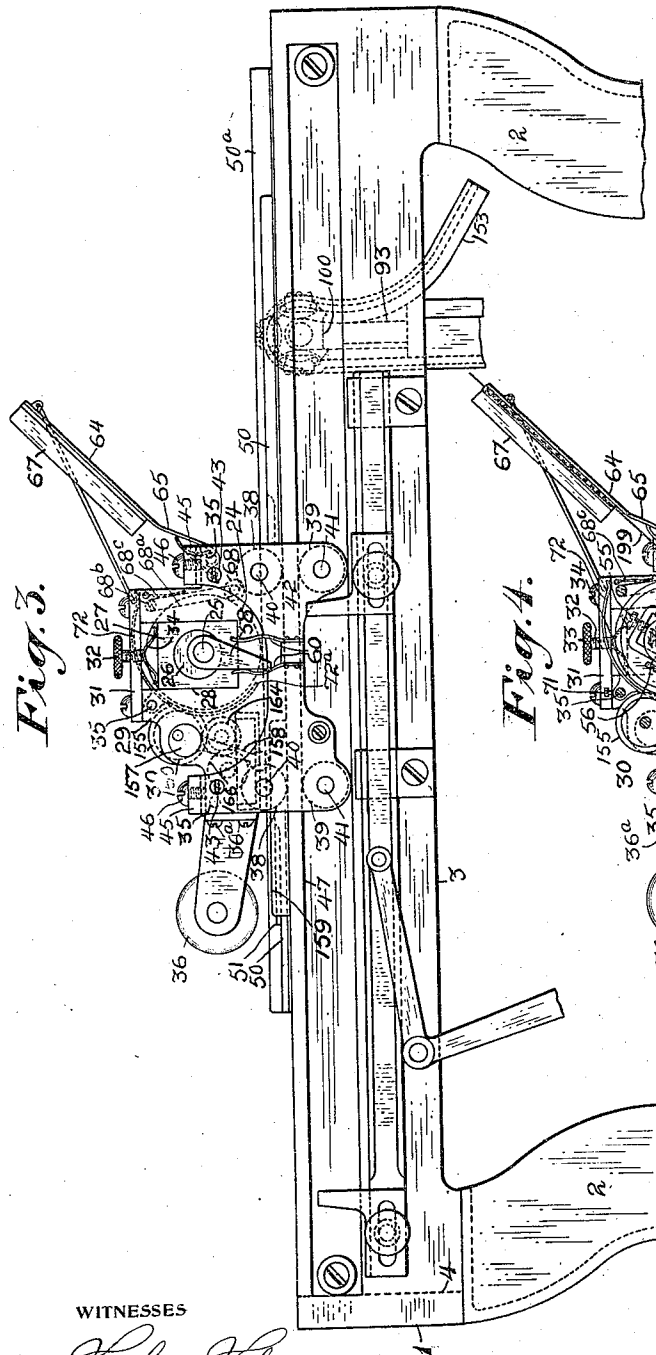
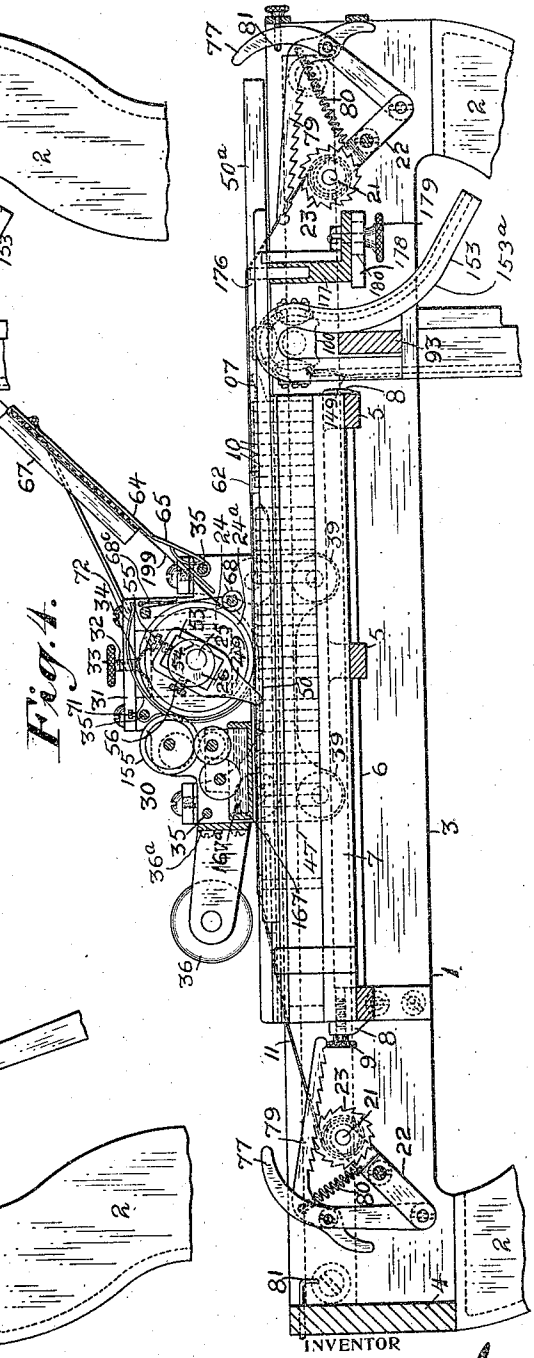


Fig. 4.



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7 SHEETS—SHEET 4.

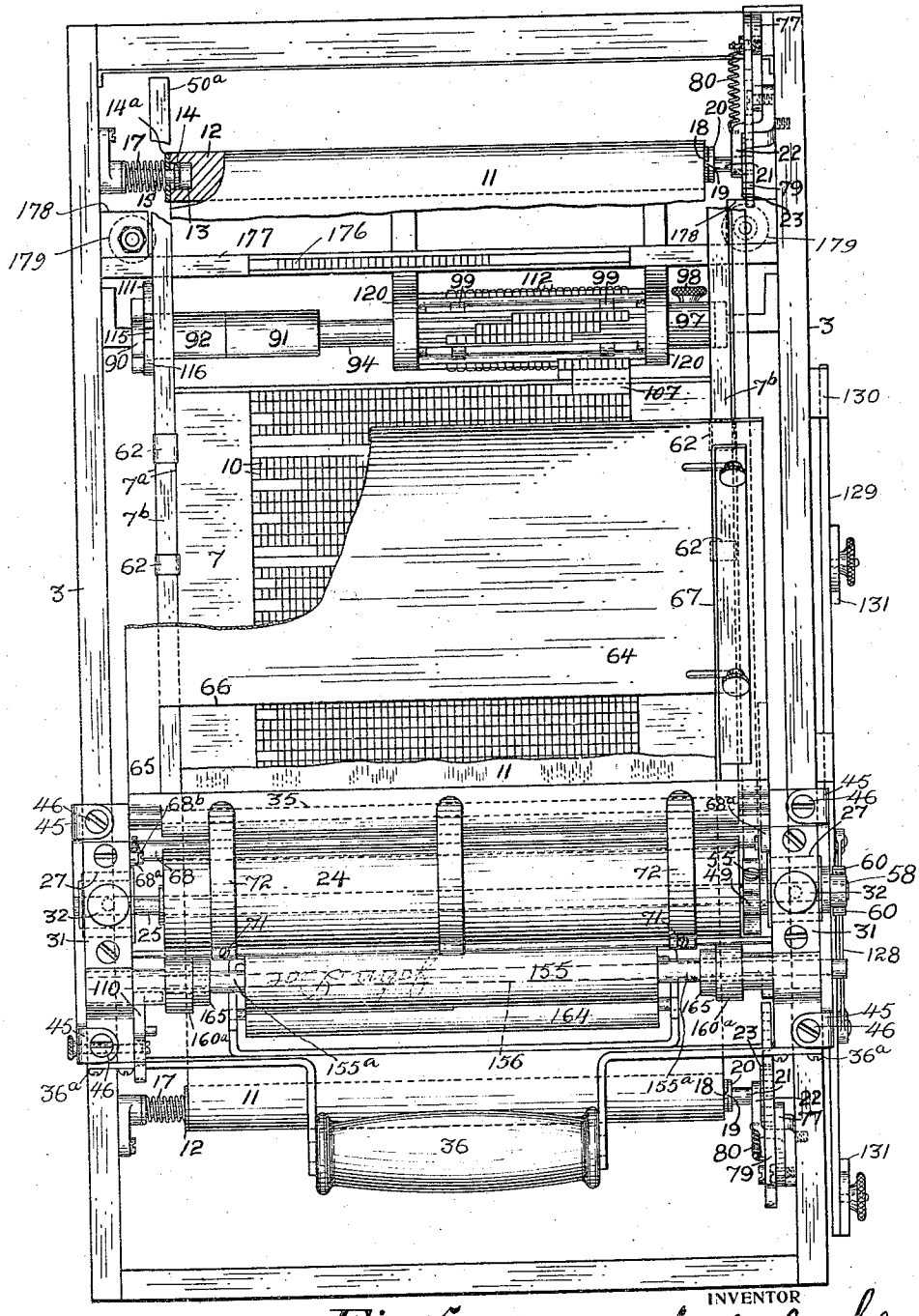


Fig. 5.

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7 SHEETS—SHEET 5.

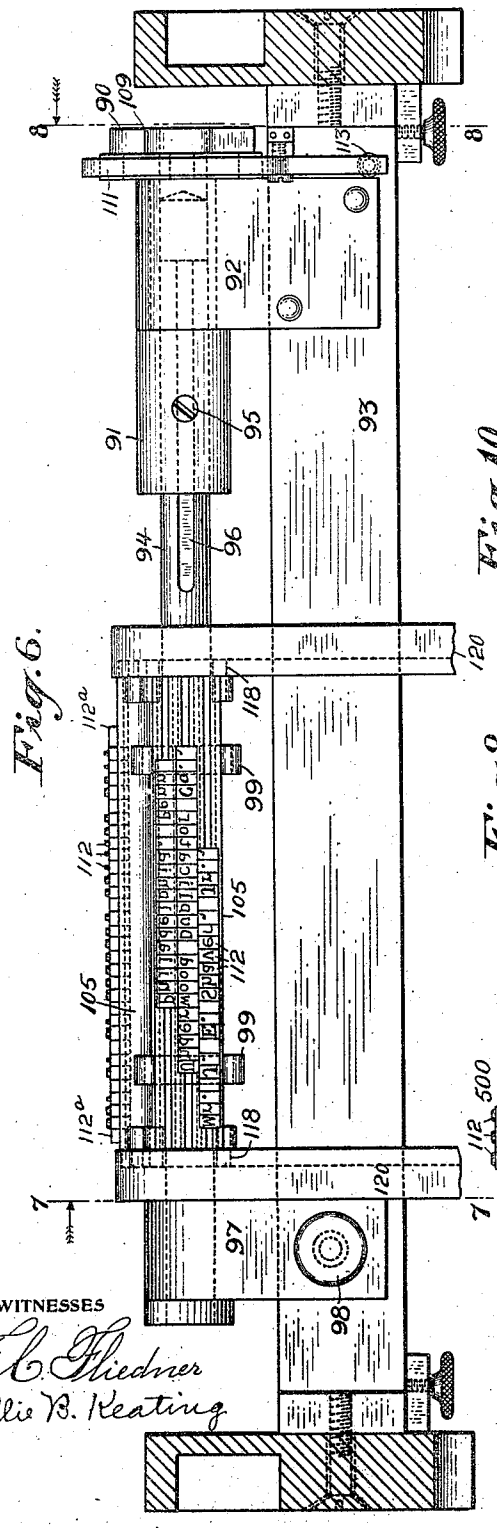


Fig. 6.

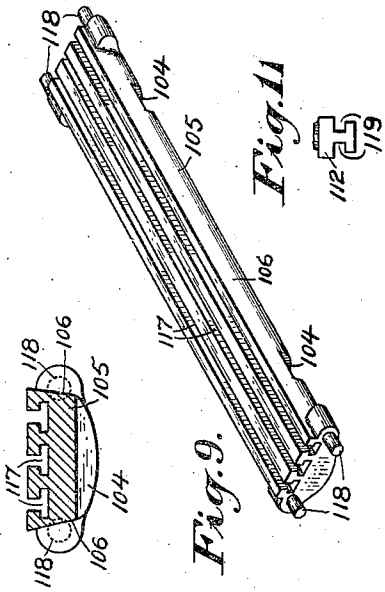


Fig. 11.

Fig. 9.

Fig. 10.

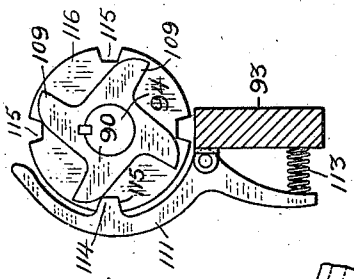


Fig. 8.

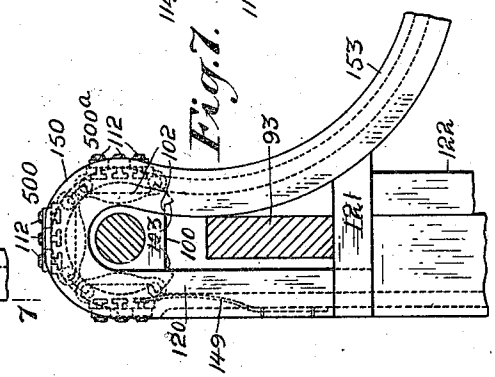


Fig. 7.

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7 SHEETS—SHEET 6.

Fig. 12.

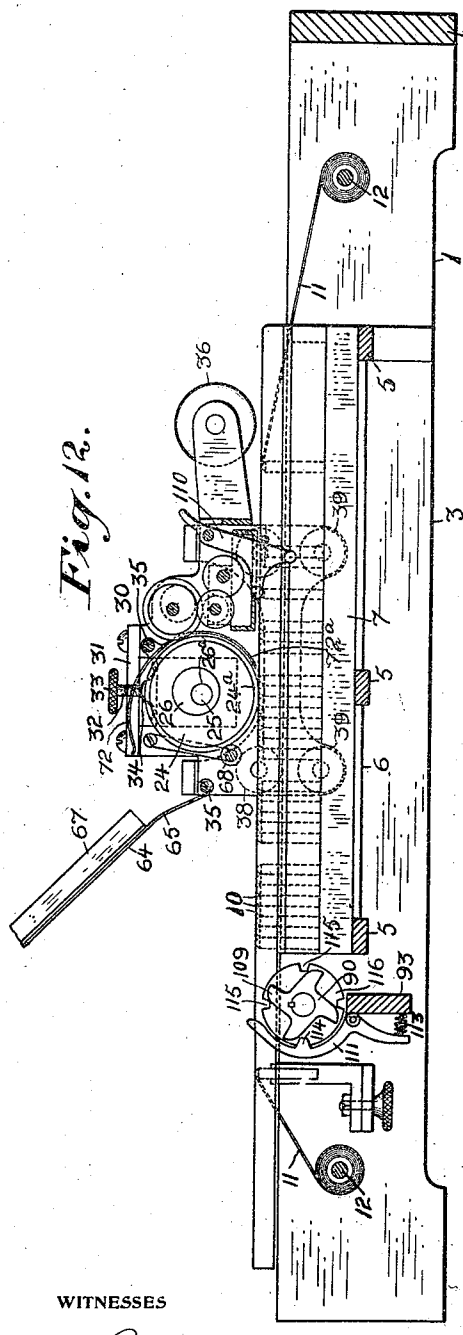


Fig. 14.

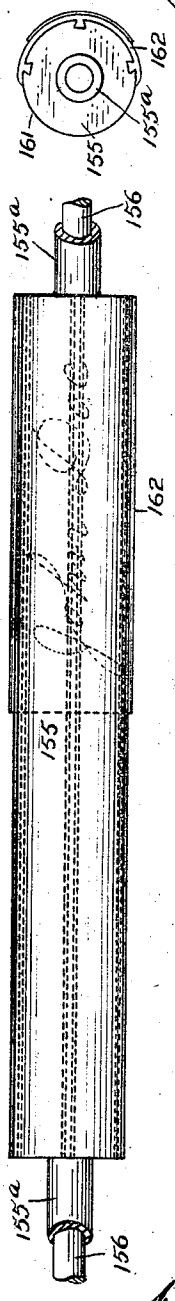


Fig. 13.

Fig. 17.

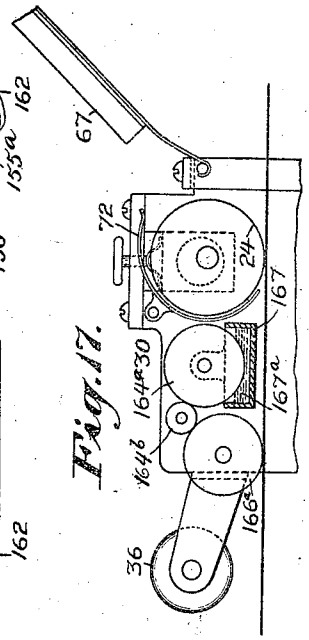


Fig. 16.

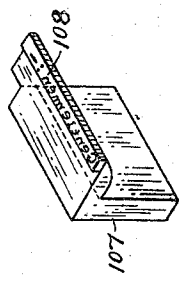
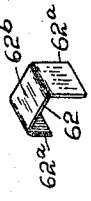


Fig. 15.



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7 SHEETS—SHEET 7.

Fig. 18.

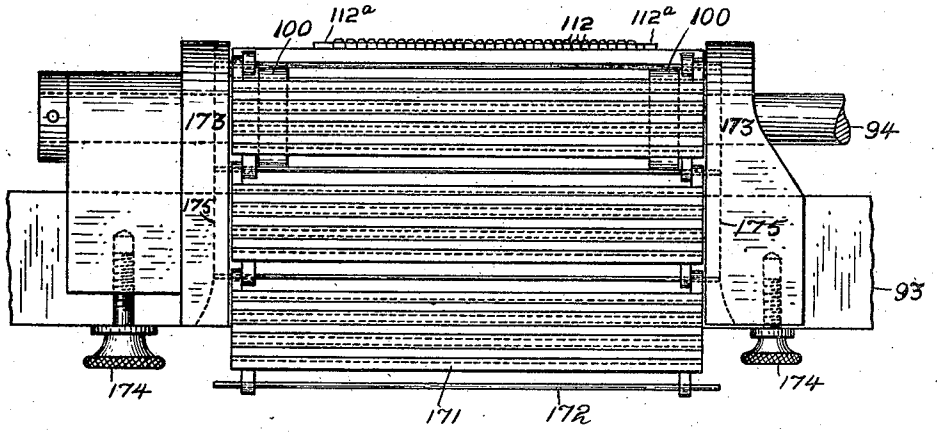
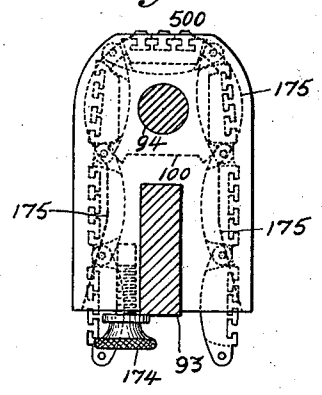


Fig. 19.



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UNITED STATES PATENT OFFICE.

WALTER WRIGHT, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO ADDRESSOGRAPH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

INDIVIDUAL-LETTER-PRINTING MACHINE.

1,179,489. Specification of Letters Patent. Patented Apr. 18, 1916.

Application filed November 13, 1908. Serial No. 462,497.

To all whom it may concern:

Be it known that I, WALTER WRIGHT, a citizen of the United States, residing at San Francisco, State of California, have invented new and useful Improvements in Individual-Letter-Printing Machines, of which the following is a specification.

This invention relates to printing apparatus, being especially adapted for general office use, printing from type-surfaced matter either directly or through an inking ribbon, and particularly for the production of personal or individual typewritten letters.

One object of the invention is to provide an apparatus of this character, which will be simple in construction and easy to operate.

A further object is to provide improved mechanism by means of which the name and address of a different firm or individual, spaced from the body of the letter, according to the regular typewriter line spacing, may be printed in succession from separate and disconnected name and address forms, through a typewriter ribbon upon each individual letter, and at the same time, and in uniformity with the printing of the subject matter or body of each letter, so as to present a series of complete personal typewritten communications, each properly addressed and individually written to a different person or firm.

A further object of the invention is to provide improved mechanism to automatically change the name and address, with each complete operation of the printing mechanism.

A further object is to provide mechanism for printing, in uniformity with, and at the same time as the body of the letter, and the name and address, etc., the proper salutation, such as "Gentlemen:—" "Dear Sir:—" etc., properly spaced from and intermediate between the letter and the name and address.

A further object is to provide mechanism for properly feeding the paper and registering the margins from the top, bottom or sides of the sheet at which the printing is done, and for automatically bringing in succession the different sheets of paper into printing position, as they are placed by hand on the paper table, and so that the printing may be done in the same relative position upon the different sheets of paper, said mechanism being capable of adjustment so that the printing position on the paper may be varied as desired.

A further object is to provide mechanism whereby each sheet of paper is automatically picked up from the type bed as it is printed, taken around the printing roller and after being turned over and the printed matter brought face up, ejected from the machine into a letter chute or other receptacle provided to receive the same.

A further object is to provide mechanism whereby the automatic means for changing the names and addresses by each complete movement of the printing mechanism, may be temporarily rendered inoperative, so that any number of letters bearing the same name and address may be printed in succession, the same mechanism being used to again intermittently change to a new name and address whenever desired by each operation of the printing mechanism.

A further object is to provide an office printing machine which may be used with ease without the usual printing office training, for printing office forms from type of any style, electrotypes, wood cuts or type surfaced material of any kind, either by use of an inking ribbon or from printing ink applied directly to the face of the type surfaced material when the ribbon or typewriter effect is not required.

A further object is to provide mechanism for printing in uniformity with, and at the same time as the body of the letter, the city or street address of the writer, the date, etc., properly spaced above the name and address of the party to whom written, and whereby the position of the date, street address, etc., may be varied as to distance therefrom or from the top of the sheet of paper.

A further object is to provide means whereby uniform results may be obtained when printing through an inked ribbon by having means for regulating the rapid movement of the ribbon by each movement of the carriage and also through relief pressure strips for preventing irregular pressure on short lines, etc.

In the accompanying drawing, Figure 1

is a side elevation; Fig. 2 is a transverse vertical section on line 2—2 of Fig. 1; Fig. 3 is an enlarged side view of the printing mechanism; Fig. 4 is a similar view showing parts in section; Fig. 5 is a plan view; Fig. 6 is a detail view showing the name and address mechanism; Fig. 7 is a transverse section on the line 7—7 of Fig. 6; Fig. 8 is a transverse section on line 8—8 of Fig. 6; Fig. 9 is a perspective view of the name and address holder omitting the type; Fig. 10 is a transverse section of the same; Fig. 11 is a detail view of one of the type; Fig. 12 is a sectional view of the printing apparatus looking from the left of Fig. 1; Fig. 13 is a detail of the signature roll; Fig. 14 is a view looking from the right of Fig. 13; Fig. 15 is a perspective view of the pressure relief lifts; Fig. 16 is a perspective view of the salutation plate and holder; Fig. 17 shows a direct inking attachment for same; Fig. 18 is a modification showing the name and address holders in chain form; Fig. 19 is a transverse section looking from the right of Fig. 18.

Referring to the drawing, 1 indicates a frame supported upon legs 2, comprising sides 3, and end plate 4. Secured upon said side plates 3 are horizontal bars 5 formed with seats 6 to receive the chase or type form holder 7. The two bars 5 at the ends of the chase 7 are also formed with seats 8 to receive the ends of the chase 7, and through one of said end bars is secured a locking screw 9, which screws into the end of the chase 7 and locks it firmly in position, while by loosening said screw 9, the chase can readily be removed. In said chase are set, in the usual manner, the type 10, and over said type extends a broad ribbon 11 of transfer or inking material, wound on ribbon rollers 12. Each ribbon roller is formed at the end with a central cylindrical recess 13 (Fig. 5) adapted to fit snugly over a flanged head 14 on a fixed shaft 15. When said recess 13 is placed over said head the corresponding end of the roller 12 can be pressed against a disk 14^a through which passes the shaft 15, which disk is pressed outward by a coiled spring 17 around said shaft. The roller can be moved in its axial direction against said spring sufficiently to allow a transverse groove 18 formed in the opposite end of the roller to receive a transverse or diametral rib 19 formed upon the face of a disk 20 secured upon an end of a shaft 21, which, at its other end, is mounted in a bearing 22 supported by a side plate 3 of the machine, and said shaft 21 has secured thereon a ratchet wheel 23 for the purpose of turning said shaft as hereinafter described. The necessary friction to resist the rotation of the ribbon roller, except when rotated by some positive mechanism, is provided by the pressure of the spring 17 against the disk 14^a. The recess 13 and groove 18 is formed on both ends of the roller 12, so that the ribbon can be changed from side to side or turned over without unwinding from the roller, the rollers or spools being thus reversible end for end. As will be presently described, one of said rollers is advanced intermittently at each operation of the machine, while the other roller then turns merely by the unwinding of the ribbon, its unwinding movement being resisted by the friction of the spring 17, thus maintaining a sufficient tension upon the ribbon to take up the slack.

The printing is effected in the following manner: 24 indicates a pressure roller, having preferably a rubber surface 24^a (Fig. 4), and loosely mounted upon a shaft 25, the ends of which shaft are secured eccentrically in disks 26, as shown at 26^a mounted in boxes 27, which can move vertically in guideways 28 formed in the side plates 29 of a carriage 30. Said guideway is closed at the top by a cross head 31, through which is screwed an adjusting screw 32 having a suitable milled head 33. The bottom of this screw bears upon a flat bow spring 34 which in turn bears upon the top of the box 27, while said box may be pressed or raised upward from undue or irregular pressure from the underside, by contact of the pressure roller with the pressure relief lifts hereafter described. By adjusting the screws 32, the desired pressure of the spring 34 on the boxes 27 can be obtained.

The two side plates 29 are connected by rods 35 which extend across the machine to form a carriage 30 and a handle 36 for moving said carriage in either direction is secured thereto at 36^a.

In each end of the carriage 30 are mounted four rollers, two upper rollers 38 and two lower rollers 39 (Fig. 3). The upper rollers 38 are mounted on shafts 40 secured directly to the side plates 29 of the carriage 30, one in front and one behind the center of the carriage, and the two lower rollers 39 are mounted upon shafts 41 secured to plates 42 secured to the side plates 29 by screws 43 which pass through slots 44 in the outer plates 42 and thus permit of vertical adjustment of said outer plates. Said plates 42 have horizontal parts 45 bent over the tops of said side plates 29, and screws 46 are screwed through said horizontal portions of the outer plates 42 and against the side plates 29 and adjust the vertical position of the lower rollers 39 relative to the upper rollers 38. Said rollers run on opposite sides of a rail 47 (Fig. 2) formed on the side of the main frame 1, the upper rollers 38, upon the upper side thereof and the lower rollers 39 against the lower side, and, since, by means of the adjusting screws 46, said rollers can be arranged to press

tightly against opposite sides of said rail 47, the carriage 30 can be moved without undue lost motion or the slightest variation of pressure upon the ribbon and type 10 during its entire travel. Upon the roller shaft 25 is carried, in the manner hereinafter described, a depending arm 49, the lower end of which, in the printing movement of the roller 24, rides upon a track or cam 50, secured at one side of the machine frame 1, and extends through a distance corresponding to that part of the travel of the carriage in which the printing may be done. Said track comprises the main grooved portion 50, the top of the extension being flush with the top of the main portion, and arranged to be held at any desired extended position, so as to lengthen the track more or less, as desired, and the arm 49 is sufficiently wide at the bottom to engage either the main portion 50, or the extension 51, or both.

It is desirable to secure the arm 49 adjustably to the eccentric bushings 26 to which the shaft 25 is secured as shown at 26^a, and is raised or lowered through the turning of said bushings 26 in either direction, so that the distance of the lower end of said arm from said shaft, may be varied to correspondingly vary the amount through which the eccentric bushings 26, to which the shaft 25 is secured at 26^a are turned, and thereby correspondingly vary the pressure of the roller 24 upon the type 10. For this purpose, the upper end of the arm 49 is slotted as shown at 53 and is slidable over a squared portion 54 on one of the eccentric bushings 26, and upon which said slotted end of the arm 49 is secured by an adjusting screw 55, the lower end of which rests upon the top of the eccentric bushing 26. Secured upon the slotted portion of the arm 49 at one side thereof is a clamp screw 56 for the purpose of clamping said arm 49 to the eccentric bushing 26 and thereby locking the arm 49 from longitudinal movement, except when it is desired to change the adjustment thereof. When this clamping screw 56 is loosened from the eccentric bushing 26, the adjusting screw 55 can be turned in either direction and thereby bodily move the arm 49 longitudinally relative to the shaft, thereby lengthening or shortening the distance of its free end from said shaft, thus regulating the distance through which the eccentric bushings 26 to which the shaft 25 is secured, are turned and thus varying the pressure of the roller 24, as hereinafter described. When said arm passes over the end of the track 50, it returns to a central or intermediate position under the pressure of one of two springs 60, secured to the carriage frame, one on each side of an arm 58. Then, on the return movement of the carriage 30, the lower end of arm 49 abuts against the end of the cam or track 50, and is thereby shifted rearwardly so that it again rides upon the track 50, but with a rearward obliquity. Upon the arm 49 being turned from its former position the eccentric bushings 26 to which the shaft 25 is secured, and upon which the roller 24 is loosely supported, are turned about their centers, and thereby said shaft 25 in said return movement is raised higher than on its printing movement, thereby raising the pressure roller 24, so that it returns freely, out of contact with the ribbon or type. The track thus serves to rock the arm 49 and through it to turn the eccentric bushings 26, and thus to raise or lower the roller 24, and the shaft 25 upon which the roller is rotatably mounted.

In printing apparatus of this character, it has been found that, when a pressure roller is moved over an assemblage of type matter, for printing letters or the like containing paragraphs, the short line at the end of a paragraph is printed heavier than when there is a full line of type, owing to the fact that the whole line of pressure is supported by said short line; the same being the case in regard to the beginning of a paragraph, when the first line thereof is not begun at the extreme edge. This is also the case in regard to the prefix and affix of a letter, or other communication, which do not occupy full lines, and which, moreover, are frequently written wider apart than the main body of the letter. This wider spacing also occurs between paragraphs when the main body of the letter is written single spacing, and the paragraphs separated by double spacing. In all such cases, in order to prevent excessive pressure at these points, I provide pressure relief lifts 62, which are in the form of thin yoke-shaped clamps, the sides 62^a of which clamp the vertical surface 7^a of the sides 7^b of the chase 7, while the middle 62^b lies upon the top of said side 7^b.

The tops of the slides 7^b of the chase are of substantially the same level as the face of the type, or a trifle lower, but the pressure relief lifts 62 are for the purpose of slightly raising the roller at those points where they are placed, so as to partly support the pressure roller, and to prevent the full pressure of the roller being imparted to a part only of the line of type. The pressure relief lifts 62 may have such contour as not to form a decided obstruction to the movement of the roller.

It is for the purpose of allowing the pressure roller 24 to rise slightly when passing over the pressure relief strips 62, that the bow springs 34 are provided and bear upon the tops of the boxes 27.

The inking ribbon 11 is extremely sensi-

tive to the pressure thereon as regards the result produced, and it is found that a provision of the above kind is desirable to produce uniform results.

The sheets of paper 199 are fed one at a time by hand, on to a sloping table 64, carried with the carriage 30 by means of arms 65 extending therefrom. The table 64, is cut out at its lower portion, as shown at 66 (Fig. 5), to permit the sheets of paper after being printed to pass therethrough as they are ejected from the machine. The paper is fed on to said table 64 from one side, (here shown on the left) and is arrested at the other side of said table by an adjustable side guide 67, against which the edge of the paper is placed. In its descent the lower edge of the paper is thus guided between said roller 24 and a small feed roller 68, carried adjacent to the roller 24 and above the type 10 by arms 68^a (Fig. 3) secured in bearings 68^b to the sides of the carriage 30 and held in frictional contact with the pressure roller, by springs 68^c. The lower edge of the paper 199 thus passes into the space between the guide roller 68 and the pressure roller 24, and when the pressure roller 24, through the action of the arm 49, and the movement of the eccentric disks 26 is brought into contact with the sides 7^b of the chase, so that it begins to roll through pressure thereon, said rolling movement causes the small feed roller 68 to revolve in unison therewith and thus feeds said paper 199 between the pressure roller 24 and said feed roller 68 which is revolved by frictional contact therewith. The paper 199 is then guided upward and around the roller 24 by fingers 72 one at each end or side of the roller and extending around the same at the opposite side to that at which the paper is fed. The pressure roller or platen, it will be observed is of such diameter that it makes more than a single revolution in its printing stroke, and while engaging the paper sheet, thereby particularly adapting the device to the production of close simulations to real typewriting while being contained in a carriage of relatively small compass and weight.

The printing on the paper 199 from the type 10, through the inking ribbon 11 is done by the pressure of the roller 24, and each sheet of paper 199 is automatically lifted from the type or inking ribbon through the movement of the carriage by the following mechanism. Adjustable to one of the transverse stay rods 35 by means of set screws 71 are attached two paper fingers 72, the lower ends of which extend within the chase 7, close to the sides thereof, and underneath the pressure roller 24. When the carriage moves from its terminal position, the first effect of the movement is to bring the arm 49 into contact with the cam or track 50, to cause the pressure roller to bear upon the sides 7^b of the chase. Thereupon the pressure roller is frictionally revolved, and with it the paper feed roller 68, causing the paper to be firmly held and fed between said pressure roller and the feed roller 68. The fingers 72 pass below the roller 24 and extend forward as shown at 72^a, so that the advancing lower end of the paper 199, after it has passed between the rollers 24 and 68 upon its further advance, slides upon the flat surface of said fingers 72 and is guided upward and around the rear of the pressure roller, between it and said fingers 72 and thereby around said roller. By this movement the paper is carried upward, and as the end of the sheet of paper, continues to advance under and around the pressure roller, through the further rotation thereof, passes from between the pressure and feed rollers, so that with this frictional movement together with the weight or momentum of the freed sheet of paper, it is carried forward thereby and ejected from the carriage into a paper chute 73 secured to the end of the frame.

The parts of the frame 50^a, coöperating with the pressure roller 24 are made of a sufficient length that the roller will rotate long enough after passing the final printing point to continue to advance the paper sufficiently to discharge it into the chute 73. This part of the frame 50^a corresponding with the sides of the chase 7, can be extended the full length of the frame, in which case the sides of the chase would be lowered.

In order to maintain the inking ribbon 11 sufficiently fresh to furnish a good impression, and one which will print equally heavy at the top or bottom of a sheet of paper, the ribbon 11 should be advanced somewhat rapidly, the advance being, of course, intermittent, and taking place only at the end of the movement of the carriage when the printing is not being effected. The advance is performed by the carriage 30 coming in contact with the upper portion of one or the other of two arms 77, which are pivoted on brackets 22 on the frame of the machine. To arms 77 are pivoted toothed pawls 79, either of which may be held in contact with a ratchet wheel 23 secured on a shaft 21, upon which is secured the disk 20 which fits upon the end of the ribbon roller 12. The toothed pawls 79 are held in contact with either of the ratchet wheels 23 by means of springs 80 secured thereto, the other end of which is secured to the bracket 22. As only one toothed pawl 79 can be used at the same time, the pawl not in use is pushed back and held by a catch 81 secured on the ends of the frame so that the teeth of the pawl are out of engagement with the ratchet wheel 23, and thus do not interfere with its movement as the ribbon is unwound from the ribbon

spool connected therewith. The pawl 79 is provided with a number of rack teeth, as shown in Fig. 4, which gives prolonged engagement thereof with the ratchet wheel 23, such engagement enduring for a considerable portion of the stroke of the carriage; thereby the ink ribbon is advanced farther than would be the case if the pawl consisted of but one single tooth.

An important feature of the invention resides in the mechanism by which different names and addresses can be printed uniformly with the main body of the letter, and are changed automatically with the printing of each sheet. Another important feature consists of the mechanism by which a proper salutation, such as "Dear sir:—", "Gentlemen:—", "Madam:—" et cetera, may be, at the same time printed according to regular typewriter line spacing intermediate between the bottom or lowest line of the address, and the first or uppermost line of the letter.

In order to produce individual typewritten letters, it is essential that they be in every particular identical with the work of a standard typewriter; that the left hand margin aline exactly, both with the body of the letter, the salutation, names and address, etc.; that the spacing between the different lines correspond with the regular spacing of the typewriter, and the spacing between the different lines for the name and address, salutation, etc., correspond with the spacing of the different lines of the letter, and with the line spacing of the standard typewriter. For this purpose there is provided a sleeve 91 rotating in a bearing 92 fixedly secured upon a transverse bar 93 (Fig. 6). In this sleeve 91, is one end of a shaft 94, movable longitudinally in the sleeve, but rotatable therewith by means of a pin 95 in the sleeve engaging a slot 96 in the shaft. Said shaft has its bearing at the other end in a support 97 adjustably secured on the transverse bar 93 by a set screw 98. By this arrangement, the shaft 94 can be moved transversely of the machine to any desired position within suitable limits, but in any position it still rotates with the sleeve 91. Said shaft 94 is movable transversely of the machine in order to permit of varying the distance or margin from the edge of the paper 199 at which the name and address begin thereon, so that said name and address may aline with the left margin of the printed matter on the sheet. Upon said shaft 94 are secured carriers 99, there being here shown two, although more may be used or one could be made to extend the entire distance between the two. Each carrier 99 has in its rim four recesses each of which has a flat surface 102 (Fig. 7), two slightly sloping sides 103, which in succession, as the shaft turns by means to be presently described, form a seat or cradle 100 adapted to enter corresponding grooves 104, across the bottom of the type holder 105, the said type holder having slightly sloping sides 106, and, being thus centered by contact with the slightly sloping sides 103 of the seat or cradle 100, of carriers 99, the said type holder is locked against movement both transversely and longitudinally.

The type used is such that the printing of the different lines of the body of the letter here shown are spaced apart by what is known as single typewriter spacing; at the same time I do not wish to limit myself to any particular width of line spacing. The spacing between one paragraph and the next is double typewriter spacing, or twice the single typewriter spacing. Between the first line of the letter and the salutation is double typewriter spacing, and between the salutation and the lowest or bottom line of the address is double typewriter spacing. The spacing between the name and address may be single or double typewriter spacing. As this spacing should be rigidly maintained, the space for the rotation of the shaft 94, the name and address holders 105 thereon, with the type 112 in said holders, is necessarily limited; I therefore provide special means to prevent the face of the type 112 from striking or rubbing against the front end of the chase 7, or other parts of the machine. As the type 112 used in the holders 105 are made of ordinary type metal, the striking or rubbing of its face would seriously damage the same, and thus destroy the utility of the invention for this particular work. The holders 105 are so shaped at their sides 106 and grooves 104 that the bottoms of the recesses 102 and the sides 103 in the form holder seats 100 on the carriers 99, fit into said grooves 104 across the bottom of name and address holders 105, and the ends or sides 103 of such seats fit snugly the slightly sloping sides 106 of the name and address holder 105 so that each name address holder is properly seated and firmly locked therein by means of the side guideways 120 and the pins or studs 118. It is also possible, without interfering with the rotation of the name and address holders 105, by use of the specially shaped support or holder 107, upon which at 108 is supported the type face for any desired salutation, to print the same spaced correctly and properly intermediate between the address and first line of the letter, without interfering in any way with the rotation of the shaft 94 or of the type 112 in the name and address holders 105 supported thereon. The salutation support or holder 107 is firmly seated inside of the chase 7, in line with the first row of type, but the same can be removed therefrom and replaced with one having a different salutation without any ad-

justment, or moving any part of the type form. It can be lifted out and replaced instantly without any adjustment. Said holders 105 are delivered to said carriers 99 by means to be presently described, and, when supported thereon, are advanced by the rotation of the shaft 94, which is rotated as follows: Upon said shaft 94 is secured a ratchet wheel 90 having four teeth 109 adapted to be engaged by a pawl 110 carried upon the extreme rear end of the carriage 30, so that when the pressure roller 24 has passed over the type 112 and completed the printing of the name and address, said pawl 110, in the further advance of the carriage 30, engages one of said teeth 109, and turns the shaft 94 through one-fourth of a revolution, after which it escapes engagement with said ratchet tooth 109. This movement brings the next name and address holder 105 into proper position for printing. Upon the return movement of the carriage 30, said pawl 110 rises and passes over the tooth 109 and has no effect in turning the shaft 94. In order to hold the shaft firmly, and prevent any rotary motion thereof except when rotated as above described, there is provided a lever lock 111, actuated by a spring 113, and having at an intermediate point thereof a square nose 114 adapted to engage any one of four recesses 115 in a disk 116 which is a part of the ratchet wheel 90. Said lever is, however, extended beyond said nose 114, and is adapted to be engaged by the pawl 110, as it advances to turn the shaft, the engagement having the effect of lifting the nose 114 out of the recess 115, and unlocking the shaft 94, before the pawl 110 arrives at the tooth 109 of the ratchet wheel 90 and thus turns said shaft 94. The pawl 110 may be thrown up when it is desired to print several copies without advancing the address forms. A quantity of letters may therefore be printed with the same address if desired.

Each holder is formed with three parallel undercut grooves 117 for type 112, the body of each of which as shown in Fig. 11, is formed with grooves 119 in its sides to fit the sides of the grooves 117 of the holder 105. Said latter grooves 117 are spaced apart, the proper distance for the type therein to print single typewriter spacing, so that the distance between the two outer grooves is suitable for printing the standard double typewriter spacing, the grooves 117 being made a distance apart to correspond exactly with the regular typewriter spacing between the lines, either single or double spacing.

Each holder 105 is also formed at each end with two longitudinally extending guide pins or studs 118, the function of said studs being to guide the holder when being delivered to the carriers 99 by the delivery mechanism hereinafter described, and in so guiding it to confine it to the proper path along the guideways 120 hereinafter described, so that the face of the type 112 carried on the holder 105 will be placed outward, between the side guides 120, so that there can be no possibility of the face of the type 112 coming in contact with the front of the chase 7 or any part of the apparatus.

120 indicates two vertical side guides attached near their upper ends to a cross head or plate 121 to which is additionally supported the top of a rear guide 122. On said rear guide slides an elevator 123, having lateral pivot pins 124, to which are pivoted links 125, to the lower ends of which are pivoted lever arms 126, upon a rock shaft 127 operated by a link 128 connected to a slide 129 which slides through guides 130, to which slide 129 are adjustably secured bumpers 131, which are adapted to be operated by a stud 132 extending laterally from the carriage 30.

The side guides 120 adjacent the printing seat overhang the studs 118 on the name and address forms, as illustrated in Fig. 6, and thereby confine them against accidental dislodgment, and the wall portions of such guides which lie adjacent the opposite ends of the forms likewise aid in determining the position of the form, when in the printing plane, coöperating with and supplementing the alining and positioning functions of the cross-bearings 104, described below, on the bottoms of the forms. The address form is thus brought to position under continuous positive control, and when making the impression is precisely alined with the form of the body of the letter, between the same and the date form, each successive form being thus similarly and precisely located, a matter of much importance.

The name and address holders 105 are contained in drawers or boxes 133, open at one end, and having rails 134 extending inwardly from their sides, upon which rails the pins 118 of the holders rest, and rails 134ª on the bottom so that the grooves 104 of the holders 105 slide thereon, so that the bottoms of the holders except at that point are out of contact with the drawers or boxes. They are fed to the machine by placing one of the drawers or boxes 133 on an inclined support 135 supported on the frame or legs of the machine, and so that the open end of the box is in front of an opening 136 beneath the vertical guides 120 and above a front wall 137 which is supported upon a movable seat 138. Said seat is connected by springs 139 with the rear guide 122, said springs being secured at the bottom to pins 140 extending outward from the seat 138 and at the top to pins 141 extending outward from the guide 122, so that the springs 139 normally tend to raise

said seat 138 and thereby to raise the front plate 137 and cut off the supply of holders 105. When the elevator 123 arrives at its lowermost position, the bottom of the elevator abuts against said seat, and depresses it, thereby depressing the front wall 137 below the bottom of the front opening 136, so that another holder 105 can pass therethrough into a lift 142 formed on the bottom of the elevator 123. When it so passes, the front or foremost end of the holder 105 arrives at the upper part of an oblique surface 143, formed on the lift 142 and, as the lift 142 rises, the pins 118 at the front or foremost side of the holder 105 are guided in a funnel-shaped portion 144, of the side guides 120, so they are brought uppermost, and thereafter the lift 142 raises said holder 105, so that the type 112 on the holder, face outward or toward the front and between the side guides 120. As soon as the elevator 123 rises from the seat 138, said seat is raised by said springs 139, so that the top of the front plate 137 rises above the level of the bottom of the inclined carrier support and the holders 105 in the box 133 can no longer be fed until the seat 138 is again depressed.

With each complete vibration of the lever arms 126, a holder 105 is lifted substantially half way up the guides 120, and at the end of said upward movement is retained against dropping with the return of the elevator 123, by means of spring actuated catches 145, which extend into the side guides 120. Said elevator has secured thereto a forwardly extending portion 146 upon which is pivoted a lifter plate 147, the lower end of which is normally pressed backward by a flat spring 148, so that the upper end extends forward. As the elevator is descending, the upper end of said lifter plate 147 passes on the rear side or bottom of the holder 105 which has been lifted half way, therefore out of contact with the type 112 and, then beneath said holder, to normal position. Upon the next upward movement of the elevator 123, said lifter plate 147 now lifts the partly raised holder 105 through the remainder of its ascent, and brings it up to the carriers 99 on the rotary shaft 94. As it is brought opposite to the vertical front carrier seat 100, of said carriers 99 the pins 118 of the holder 105 are engaged by springs 149, and are pressed rearward thereby in succession first the advancing and then the succeeding pins, so that the holder 105 is properly seated and locked in position through the grooves 104 and the carrier seats 100. From this point the guideways 120 continue around the carriers 99 in a curve as shown at 150. Upon the next movement of the carriage 30, the carrier shaft 94 is as already explained rotated one-fourth of a revolution, bringing the holder 105 into printing position 500. (In order to insure the exact seating of the holder 105 in the carrier seats 100, and to lock the same therein, springs may bear upon the pins 118 of the holder, and thereby press the grooves 104 of the holder 105 down upon its seats 102 and the sides of the holder so they firmly lock it, in its printing position 500.)

Upon the next movement of the carriage 30, the carrier shaft 94 is again rotated through another quarter of a revolution, so that the holder 105 is moved to a vertical position 500ª upon the rear side of the carrier 99 and the carrier shaft 94, and the next holder 105 is brought into printing position 500 in the same manner. Upon the next movement of the carriage 30, the carrier shaft 94 being again rotated through a quarter of a revolution, said first holder 105 is released from the carrier 99, the carrier seats 100, and said holder 105 now slides by gravity down curved guide grooves 153 which receive the pins, and the holder 105 is thereby discharged and slides into an empty drawer or box 133ª placed there to receive the same.

For the purpose of applying an autographic signature in ink to the letter so printed, I provide a signature roll 155 mounted loosely on a shaft 156, which shaft is mounted eccentrically in disks 157, which are supported in seats 160 in the side plates of the carriage, as indicated in the drawing. From one of the disks 157 there extends an arm 158, which is adapted to engage a special slideway or track 159 at a predetermined point in the travel of the platen carriage thereby, vibrating or rocking said eccentric disks 157 and bringing the rollers 160ª, which are also mounted loosely on the shaft 156 and connected to the signature roll, into contact with the platen roller 24 causing said signature roll 155 to rotate in unison with the pressure roller 24 through a complete revolution of the signature roll. The rollers 160ª are secured to or are integral with the signature roll 155, so as to rotate the latter as described, the connection comprising necks or reduced parts 155ª extending between said rollers 160ª and the signature roll and surrounding the shaft 156. The said reduced portions of the signature roll which connect the body thereof with the parts 160ª are necessary in order to provide clearance for the end paper guide fingers 72, and also in order that the signature roll shall receive one complete revolution for each printing stroke of the carriage and thus be left in the same angular position after it has completed the operation of affixing the signature. Figs. 13 and 14 illustrate a detail of the signature roll, 162 being a curved plate slid endwise into under-cut grooves formed

in the body of the roll. The surface of this plate is formed to have contact with the platen roller and print the signature thereon, while the rest (161, Fig. 14) of the roll uncovered by the plate 162 has no contact therewith, as will be evident. The undercut grooves extend the full length of the roll and the signature plate 162 is adjusted thereon to bring the signature at the proper distance from the margin of the printed sheet. As the paper moves upwardly on the platen and beneath the paper guide fingers 72, the pressure roll, or rather the signature plate thereon, is automatically brought into printing engagement therewith and prints the signature at the foot of the paper sheet, while the latter is in motion and being removed from the printing plane. The necessary pressure for so printing the signature is derived from the action of the eccentric arm 158 coming against the special track 159. This pressure can be varied through the movement of the eccentrics 157 either by lowering or raising the track 159 or by lengthening or shortening the arm 158. The means for so lengthening or shortening the arm 158 may be precisely like those already disclosed for the lengthening or shortening of the arm 49 of the main pressure roller 24, and I do not deem it necessary to repeat such description for the signature roller. The signature roll is kept supplied with ink by an inking roller 164, which is rotated by contact therewith, and also runs in contact with an ink roller 166 which dips into an ink-well 167 (Figs. 3 and 4).

Figs. 18 and 19 represent a modification of the present invention in which the name and address holders 171 are pivotally connected to each other at their ends to form a chain, said chain carried around the shaft 94 by the cradles 100. The transverse bars 172 are of greater length than the name and address holders and the ends of the bars are adapted to slide in their upward and downward movement in suitable guideways 175 in the guides 173 so that the name and address holders are rigidly locked on said cradle during the printing movement, so that the type in said holders are prevented from coming in contact with any part of the machine during the movement of the name and address holders. The guides 173 are suitably locked to the bar 93 by said screws 174.

The date line is seen at 176 and is covered by the inking ribbon. The address forms occupy a position between said date form and the main form. The date line is carried in a holder 177 resting upon a pair of supports 178, Figs. 4 and 5. To adjust the date form forwardly and backwardly, so that it may register with any printed line upon the sheet to be printed, the holder 177 is secured adjustably to the supports 178 by means of screws 179, which pass up through slots 180 in the holders 178. It will be seen that the chain guide 153 is bowed inwardly at 153^a to clear the date line form, Fig. 4.

When the ribbon is disconnected from the machine, the carriage shown at Fig. 17 may be substituted for the other carriage and the types may be directly inked from the fountain 167^a.

It is to be understood that when the inking device shown in Fig. 17 is employed, the signature roll 155, is not employed, the signature in this instance being produced by suitable types or other printing surfaces forming part of the matter in the chase 7. In the construction shown in this figure, the ink roller 164^a, runs in direct contact with the ink 167^a, and a transfer or distributing roller 164^b, that runs in contact with roller 164^a, applies the ink to the inking roller 166^a.

The signature printing device herein described is also shown and described, and certain features and developments thereof are claimed, in another copending application, Serial No. 589,405, and certain features of the lateral adjustment of the address-printing mechanism and conveyer mechanism are likewise more fully described and claimed in the said co-pending application.

I claim:—

1. The following instrumentalities combined to produce a machine for preparing a series of seemingly typewritten communications for different addresses, namely, a reciprocating carriage, a revoluble platen thereon, a main form of typewriter types for printing the body of the communication, a succession of separate address forms, means connected to said carriage for advancing the address forms, a ribbon beneath the platen and overlying the main form and the address form, means for depressing said platen to make the impression during the printing stroke and for elevating said platen clear of the ribbon during the return stroke, and means for advancing the ribbon while the platen is elevated.

2. The following instrumentalities combined to produce a machine for preparing a series of seemingly written and signed communications having different addresses, namely, a platen, a main form of types for printing the body of the communication, a succession of address forms, means for effecting reciprocation between the platen and the forms, means for moving the address forms successively to working positions, a ribbon between said forms and said platen, a signature form or plate, and means for inking said signature form and pressing it upon the sheets, said platen being in the form of a revoluble cylinder,

and said signature form being provided upon a revoluble support to coact with said platen to print the signature.

3. The following instrumentalities combined to produce a machine for preparing a series of seemingly written and signed communications having different addresses, namely, a platen, a main form of types for printing the body of the communication, a succession of address forms, means for effecting reciprocation between the platen and the forms, means for moving the address forms successively to working positions, a ribbon between said forms and said platen, a signature form or plate, means for inking said signature form and pressing it upon the sheets, said platen being in the form of a revoluble cylinder, and said signature form being provided upon a revoluble support to coact with said platen to print the signature, an ink fountain, and means for distributing ink from said fountain upon said signature form.

4. The following instrumentalities combined to produce a machine for preparing a series of seemingly written and signed communications having different addresses, namely, a platen mounted to reciprocate bodily and to rotate, a main form of types for printing the body of the communication, a succession of address forms, means for effecting reciprocation between the platen and forms, means for moving the address forms successively to working positions, a ribbon between said forms and said platen, a signature form or plate, and means for inking said signature form and pressing it upon the sheets while on the platen, means being provided to move said signature form to and away from said platen.

5. In a machine for producing seemingly typewritten letters, a frame and a carriage traveling on the frame, and having a platen roller, and paper-feeding and discharging means, the said frame having track surfaces on which the platen roller may travel to give it rotary movement; in combination with a printing form over which the carriage travels to give printing and return movements to said platen, the said track surfaces having extensions beyond the printing form to cause the paper to be discharged.

6. In a letter printing machine, the combination with a frame having a fixed bed for a letter form, a date line holder also on a fixed part of said frame, and a support for address holders between the bed of the main form and the date line holder, said support being mounted to revolve, of a carriage and a roller platen thereon, a series of address holders beneath the bed and feeding means delivering address holders upward through the bed at about right angles thereto, between the main form and the date holder, and for seating said address holders on said support.

7. In a letter printing machine, the combination with a fixed bed having a letter form and a date form, of a reciprocating carriage provided with a roller platen, separate address form holders, and means for feeding said holders into position in the bed, a seat for said address holders, between the letter form and the date form, an inking ribbon covering all three forms and means coördinated with the reciprocating carriage to advance the said ribbon automatically between the printing strokes thereof.

8. In a letter printing machine, the combination with a fixed bed having a letter form and a date form, of a reciprocating carriage provided with a roller platen, address holders, and means for feeding said holders upward through the bed, and a revolving seat for said address holders, between the letter form and the date form, said feeding means having operative connection with the carriage.

9. A machine for making imitation typewritten letters, comprising a main form, an automatically changing form comprising a type surface, and a holders or carrier for such surface, a printing seat for such carrier adapted to hold the same in the printing position, an ink ribbon, and a roller platen coacting with both said forms, in combination with a pair of side guides overlying opposite portions of said carriers or holders and confining the same to the said printing seat.

10. A machine for printing imitation typewritten letters, comprising a main form to print the body of the latter, a date form and holder therefor spaced from the main form, and an automatically changeable address form, a seat to hold the latter in the space between the date line holder and the main form, an ink ribbon, and a roller platen coacting with all said forms, in combination with side guides adjacent to said seat, serving to guide the said changeable forms to and from the same.

11. In apparatus of the character described, the combination of a frame a bed element thereon, a carriage element, an eccentrically mounted shaft on said carriage, a roller on said shaft, means for reciprocating one of said elements relative to the other, a plurality of unconnected and independent type-surfaced means for printing changeable matter, type-surfaced means on said bed for printing permanent matter, an inking ribbon over both of said type-surfaced means and beneath the pressure roller, and means for intermittently advancing said first-named type-surfaced means in succession into the same plane as the second.

12. In an apparatus of the character de-

scribed, the combination of a frame a bed element thereon, a carriage element, a pressure roller on said carriage, means for reciprocating one of said elements relatively to the other, an eccentrically mounted shaft for said roller, a plurality of individually type-surfaced means for printing changeable matter, type-surfaced means on said bed for printing permanent matter, an inking ribbon over both of said type-surfaced means and beneath the pressure roller, means for intermittently advancing said first named type-surfaced means in succession into the same plane as the second means, a locking device for said advancing means, and means independent of the advancing means for unlocking the said device.

13. In an apparatus of the character described, comprising a frame, a carriage, a pressure roller on said carriage, type-surfaced matter on said frame for printing permanent matter, a plurality of independent and disconnected type-surfaced means for printing names and addresses, a supporting seat for such means, automatic mechanism for successively substituting one of such means for another in their said supporting seat, an inking ribbon over said type-surfaced means and beneath the pressure roller and means actuated through the movement of the carriage for bringing said pressure roller into contact with said type-surfaced matter during its forward movement and for raising said roller out of contact therewith on its return movement, substantially as described.

14. The following instrumentalities combined to produce a machine for preparing a series of seemingly typewritten communications having different addresses, namely, a frame, a carriage, a roll platen on said carriage, means for reciprocating said carriage, a succession of independent address forms of typewriter types, a form of typewriter types on said frame for printing the body of the communication, and means connected with the carriage for individually advancing said address forms successively into position to form the heads of the communications.

15. The following instrumentalities combined to produce a machine for preparing a series of seemingly typewritten communications having different addresses, namely, a frame, a carriage, a roll platen on said carriage, means for reciprocating said carriage, a succession of independent address forms of typewriter type, a fixed form of typewriter type on said frame for printing the body of the communication, and means connected to the carriage for intermittently advancing said address forms successively into position to form the heads of the communications, said advancing means including a rotatable shaft, and supporting means upon said shaft for said address forms.

16. The following instrumentalities combined to produce a machine for preparing a series of seemingly typewritten communications with different addresses, namely, a frame, a carriage, a roller platen on said carriage, means for reciprocating said carriage, a succession of independent address forms of typewriter types, a fixed form of typewriter types on said frame for printing the body of the communication, means connected to the carriage for intermittently advancing said address forms successively into position to form the heads of the communications, an inking ribbon covering said body and address forms, and means to advance said ribbon.

17. In a machine to produce a series of seemingly typewritten communications, the combination of a bed having means for fixedly supporting a form to print the body of the letter, a magazine containing a series of independent address forms, means for moving them in succession from the magazine to proper printing position in relation to the fixed form, and a roller platen movable over both the fixed form and the address form that is in printing position, the address forms having movement through the bed at approximately right angles thereto, to the printing position.

18. The following instrumentalities combined to produce a machine for preparing a series of seemingly typewritten communications for different addresses, namely, a reciprocating carriage, a revoluble platen thereon, a main form of typewriter types for printing the body of the communication, a succession of independent address forms, means connected with the carriage for advancing the address forms, a ribbon beneath the platen and overlying the main form and the address form, means for depressing said platen to make the impression during the printing stroke and for elevating said platen clear of the ribbon during the return stroke, and means for advancing the ribbon while the platen is elevated.

19. Apparatus for printing imitation typewritten matter, comprising a main form, an automatically changing form, a roller platen and an ink ribbon between the latter and both forms, in combination with means for discharging the printed sheet and means for printing on such sheet while moving from the ink ribbon.

20. Apparatus for printing imitation typewritten letters, comprising a main form for printing the body of the letter, an automatically changing address form, and an ink ribbon and roller platen coöperating with both forms, in combination with a separately inked printing device, operative on

the printed sheet while in motion from the ribbon to the place of its discharge.

21. Apparatus for printing imitation typewritten letters, comprising a main form, an automatically changing address form, a roller platen and an ink ribbon between the latter and both forms, in combination with an independently inked printing roller having intermitent printing engagement upon the printed sheet.

22. Apparatus for printing imitation typewritten letters, comprising a main form, an automatically changing address form, an ink ribbon and a roller platen coöperating with both forms to make the impression, in combination with an independently inked signature printing roller and means for advancing the same into printing-engagement with the moving sheet.

23. Apparatus for printing imitation typewritten letters, comprising a main form, an automatically changing address form, an ink ribbon covering both forms and a roller platen coöperating therewith to make the impression, in combination with means for lifting the end of the printed sheet from the ribbon and a signature printing device acting on said lifted end before the termination of the printing stroke.

24. Apparatus of the kind described, comprising a main form to print the body of the letter and a changeable form to print the address, both covered by an ink ribbon and coacting with a roller platen to make the impression, means for changing the said changeable form, an automatic positive lock for such means adapted to lock the changeable form in its printing position and means whereby such lock is automatically released prior to the operation of said form-changing means.

25. Apparatus of the kind described, comprising a fixed main form and a changeable form, both covered by an ink ribbon, a roller platen adapted to reciprocate over the ribbon and both said forms to make the impression, in combination with means for changing said changeable form, that are controlled by the reciprocation of the platen, a lock for such means and a member moving with the platen for releasing that lock.

26. Apparatus of the kind described, comprising a main form to print the body of the letter and a changeable form to print the address, an ink ribbon covering both forms, and a roller platen having a printing and a return stroke thereover, in combination with automatic means for changing the address forms, said means comprising an address-changing device mounted at the rear side of the advancing platen carriage and operating during the printing stroke of the roller platen and after the printing impression on such stroke has been made.

27. Apparatus of the kind described, comprising a main form and an automatically changeable form, an ink ribbon covering both forms, a roller platen and means whereby said roller platen is reciprocated over said main and changing forms to take an impression from both of said forms in a single stroke, said means comprising a trackway, a carriage and parts moving therewith, in combination with a ribbon feeding means comprising a ratchet rack having a member normally disposed in the path of one of said parts moving with the roller platen and adapted to be operated by contact with such part between the printing strokes of said platen, a ratchet wheel engaged by said rack and a ribbon spool for the said ribbon connected to the ratchet wheel.

28. Apparatus of the kind described having printing and return strokes, comprising a main form and an automatically changing address form, an ink ribbon covering both forms and a roller platen coacting therewith during the printing stroke, in combination with a ribbon feeding device comprising a wheel, a rack member serving to rotate said wheel and means for moving said rack member only at the termination of one of the strokes of the apparatus.

29. Apparatus of the kind described, comprising a main form to print the body of the letter and an automatically changing address-printing form, a ribbon overlying both forms and a roller platen coöperating with such ribbon and both forms, a spool for the ribbon, supporting means therefor in which such spool is reversible end for end, and means for actuating said supporting means and spool between printing strokes.

30. Apparatus of the kind described, comprising a main form and means for successively advancing different address forms into the printing plane of said main form, comprising a container, an elevator adapted to advance such forms from the container upwardly toward the main form, and means coöperating with the elevator for seating and alining the said elevated address forms in printing position, in combination with an ink ribbon covering said main form and the seated address form, a roller platen coacting with the ink ribbon and with both forms.

31. Apparatus of the kind described, comprising a main form and means for advancing different address forms into the printing plane thereof, comprising a container, a two-stage elevator adapted to advance such forms from the container to the main

form, means for seating the elevated address form in alined printing position, an ink ribbon covering the main form and seated address form, and a roller platen cooperating with the ribbon and both forms.

32. Apparatus of the kind described, comprising a main form, means for successively advancing different address forms into the printing plane thereof, comprising a container for such forms, means for advancing the individual forms from the container toward the main form a seating device receiving the form from said advancing means, an ink ribbon covering the main form and seated address form, a roller platen coacting therewith and means for conducting the address form from the seating device.

33. In apparatus of the kind described, the combination of a fixed main form, a reciprocating roller platen carriage therefor, means for advancing different address forms to the printing plane of the main form comprising a magazine and a transferring device connected with the reciprocating carriage, with a seating device adapted to receive the address form from the transferring means and hold the same during printing and means for conducting the address form from the said seating device.

34. In apparatus of the kind described, the combination of a main form, a changeable form, an ink ribbon covering both forms, a roller platen coacting therewith, said changeable form comprising a holder having a typewriter type form therein and provided with guide lugs 118 and guiding means overhanging said lugs and confining the holder in printing position, substantially as described.

35. In apparatus of the kind described, a changeable form carrier comprising a grooved plate or body having guiding lugs thereon and cross-bearings on its under surface, in combination with a seat for said holder having coöperating cross-bearing surfaces adapted to maintain the holder against movement in its own plane.

36. Apparatus of the kind described, comprising a main form, a seat for a changeable form and a roller platen coöperating with both forms to make an impression therefrom, in combination with a tray support and a removable tray thereon containing a plurality of separate, changeable forms, and automatic elevator mechanism operating to take said changeable forms and place them successively on the said seat.

37. In apparatus of the kind described, a main form, a seat for a changeable form, a roller platen coöperating with both forms to make the impression therefrom, a container of independent separate changeable forms, a member for successively removing such forms from the container, and another member for placing such removed forms in the printing position on said seat.

38. Apparatus for printing imitation typewritten letters, comprising a main form of typewriter type representing the body of the letter, a supplementary form, an ink ribbon adapted to cover the main form, an ink supply device and automatic means for transferring ink therefrom to the supplementary form, in combination with a roller platen coöperating with both said forms to print therefrom in a single operation and making more than a single revolution while in contact with the paper sheet, and automatic means for advancing the ribbon over the said main form.

39. In combination with a bed and a reciprocating impression roll, a signature roll eccentrically mounted and means for shifting the roll to bring it intermittently into and out of frictional contact with the said impression roll.

40. Apparatus for producing imitation typewritten letters, comprising a main form of typewriter type representing the body of the letter, an automatically changing form representing the name and address of such letter, a supplementary form, an ink ribbon adapted to cover the main and changeable forms, an ink supply device independent of the ribbon and automatic means for transferring the ink therefrom to said supplementary form, in combination with means for guiding the paper sheet into printing relation to such forms and a roller platen coacting with all said forms to take the impression therefrom in a single operation.

41. A machine for making imitation typewritten letters, comprising a main form of typewriter type, a ribbon covering the same, a roller platen and means for guiding the paper sheet between the platen and ribbon, in combination with a changeable form beneath the ribbon, mechanism for automatically removing such form and successively substituting others in place thereof, and means for rendering such mechanism inoperative to repeat the impression from one of said changeable forms.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WALTER WRIGHT.

Witnesses:
EUGENE W. LEVY,
NELLIE B. KEATING.