July 13, 1926. 1,592,470

J. A. B. SMITH

MANIFOLD WEB PRINTING MACHINE

Filed April 14, 1923 5 Sheets-Sheet 1

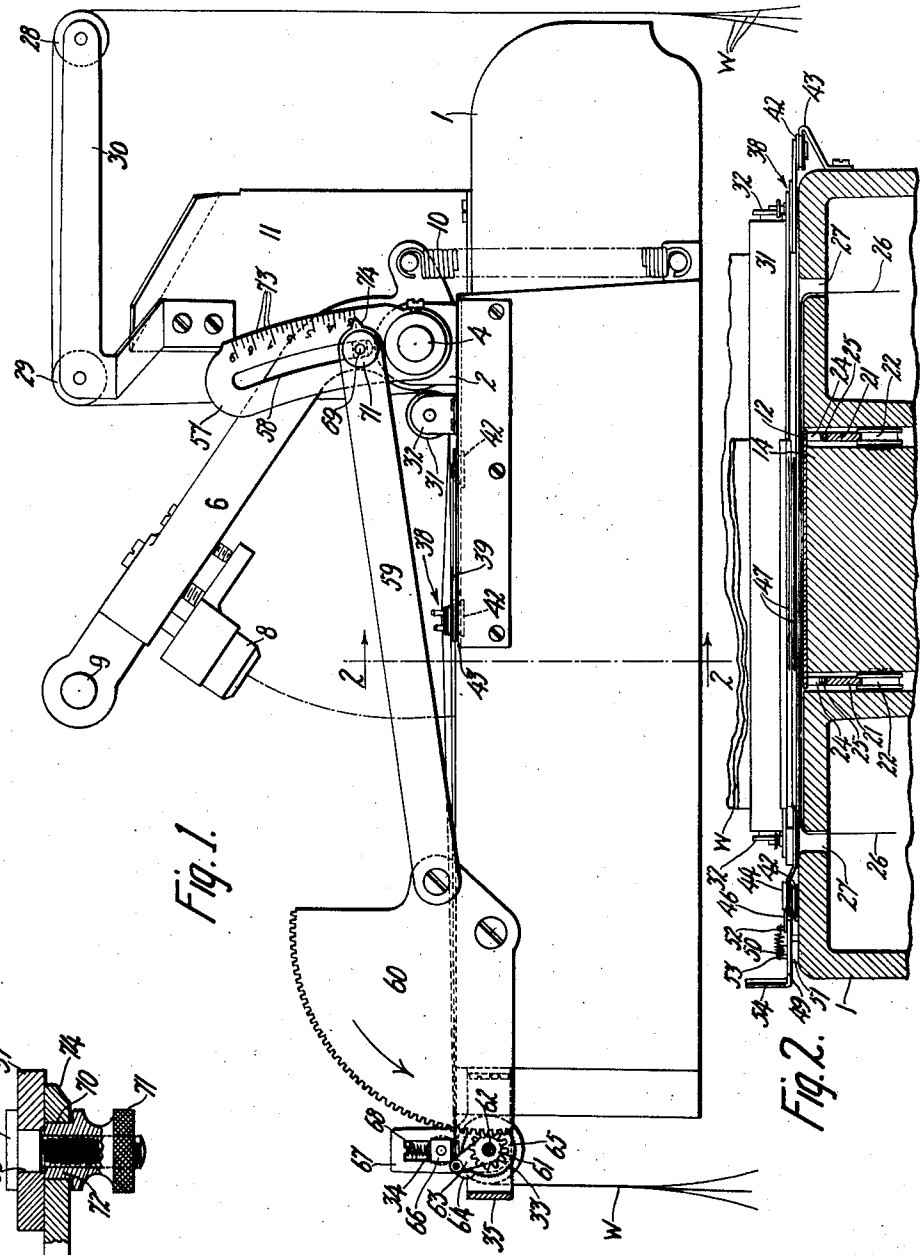


Fig. 1.

Fig. 2.

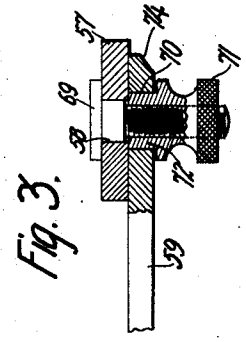


Fig. 3.

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MANIFOLD WEB PRINTING MACHINE

Filed April 14, 1923 5 Sheets-Sheet 2

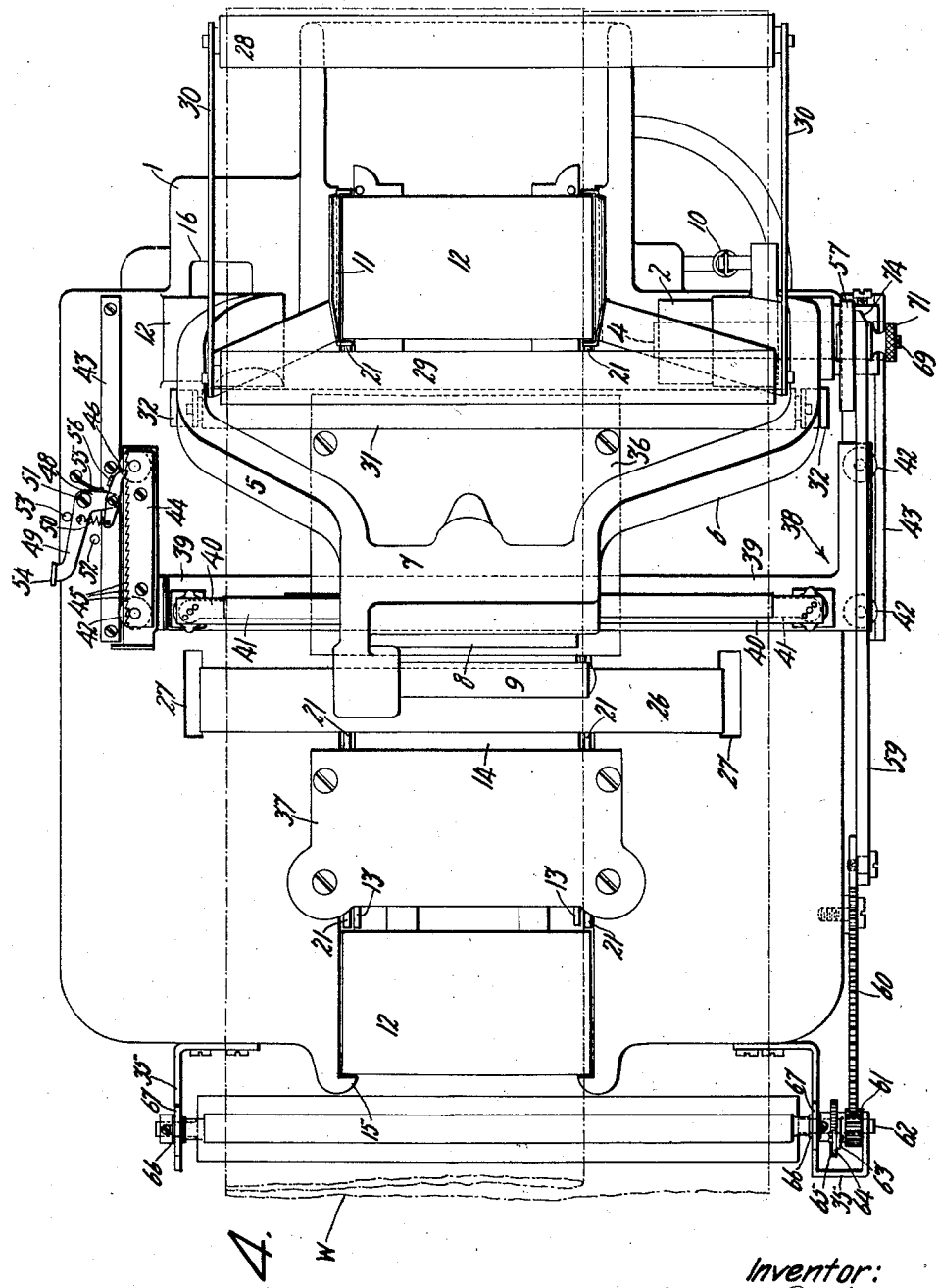


Fig. 4.

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MANIFOLD WEB PRINTING MACHINE

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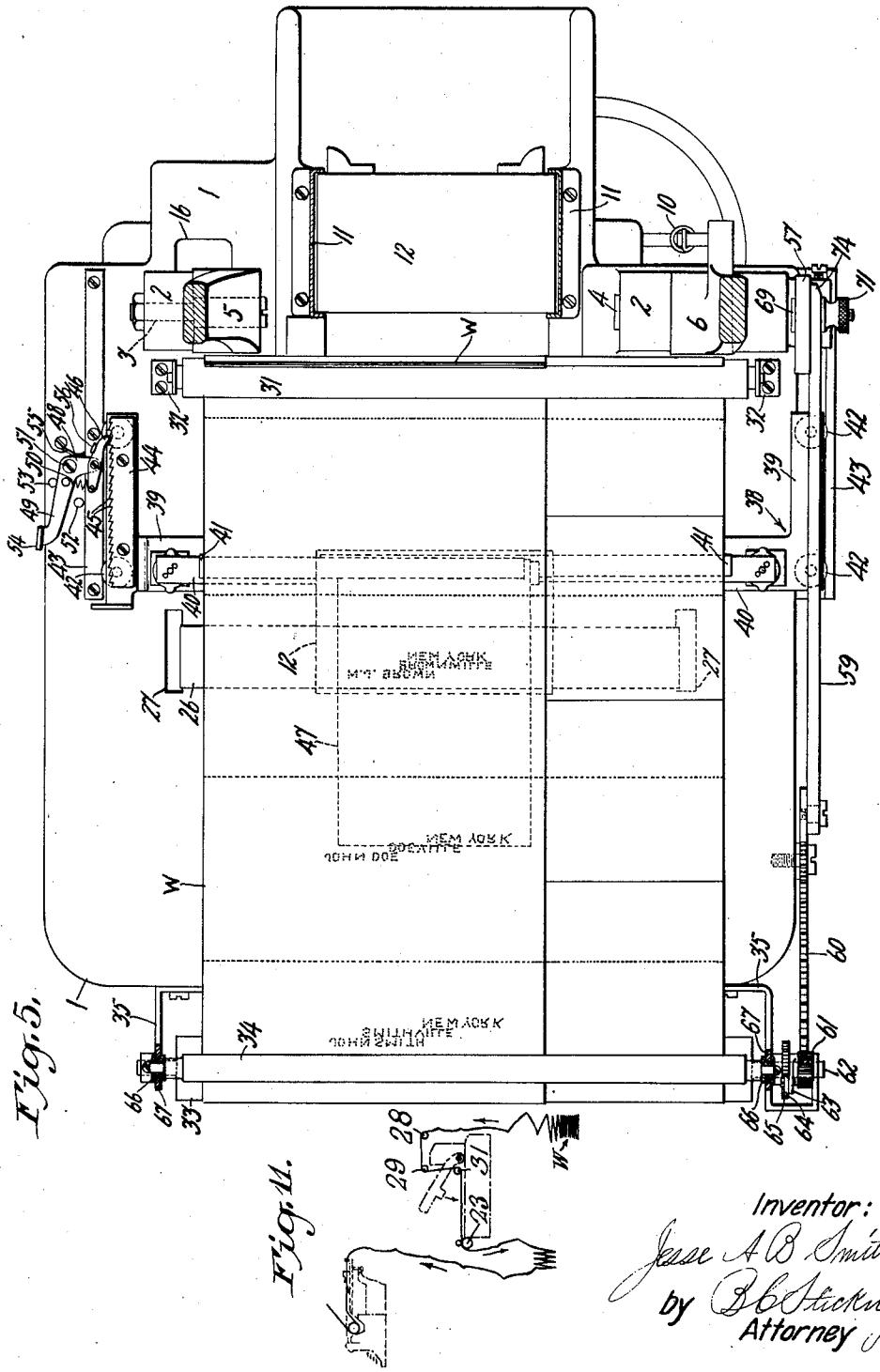


Fig. 5.

Fig. 4.

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MANIFOLD WEB PRINTING MACHINE

Filed April 14, 1923 5 Sheets-Sheet 4

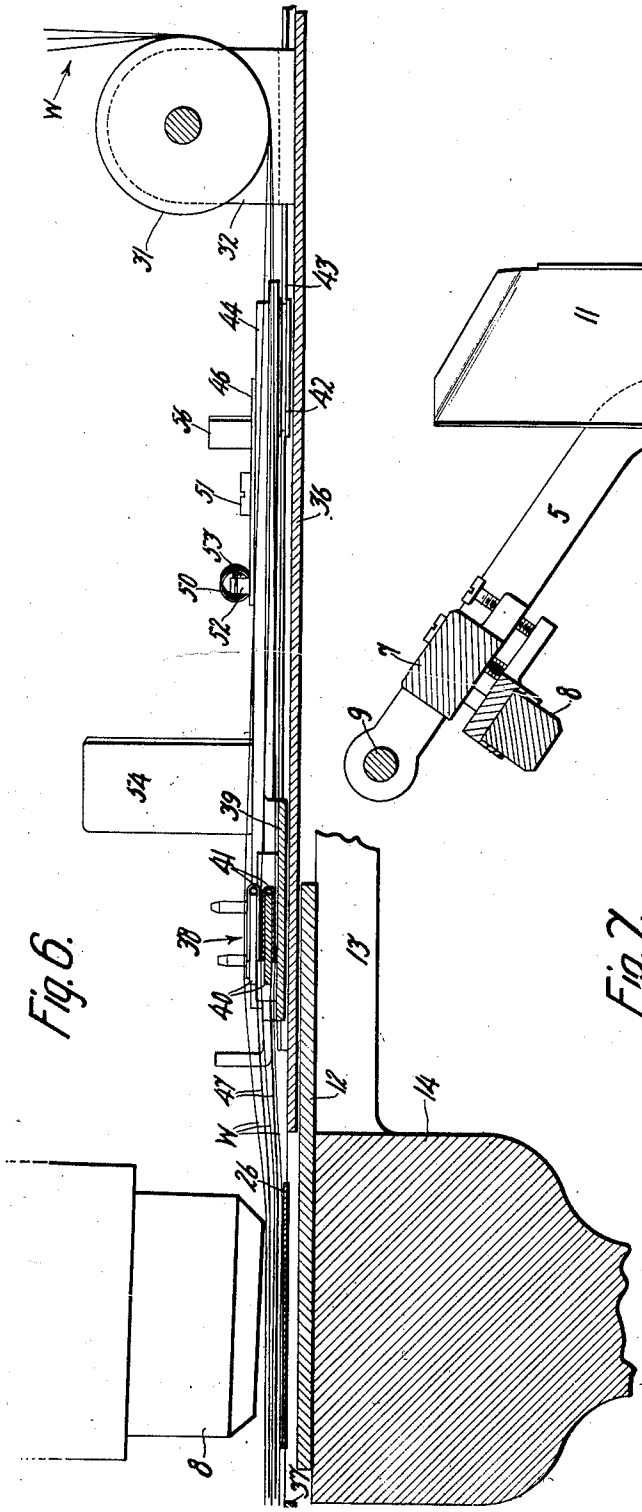


Fig. 6.

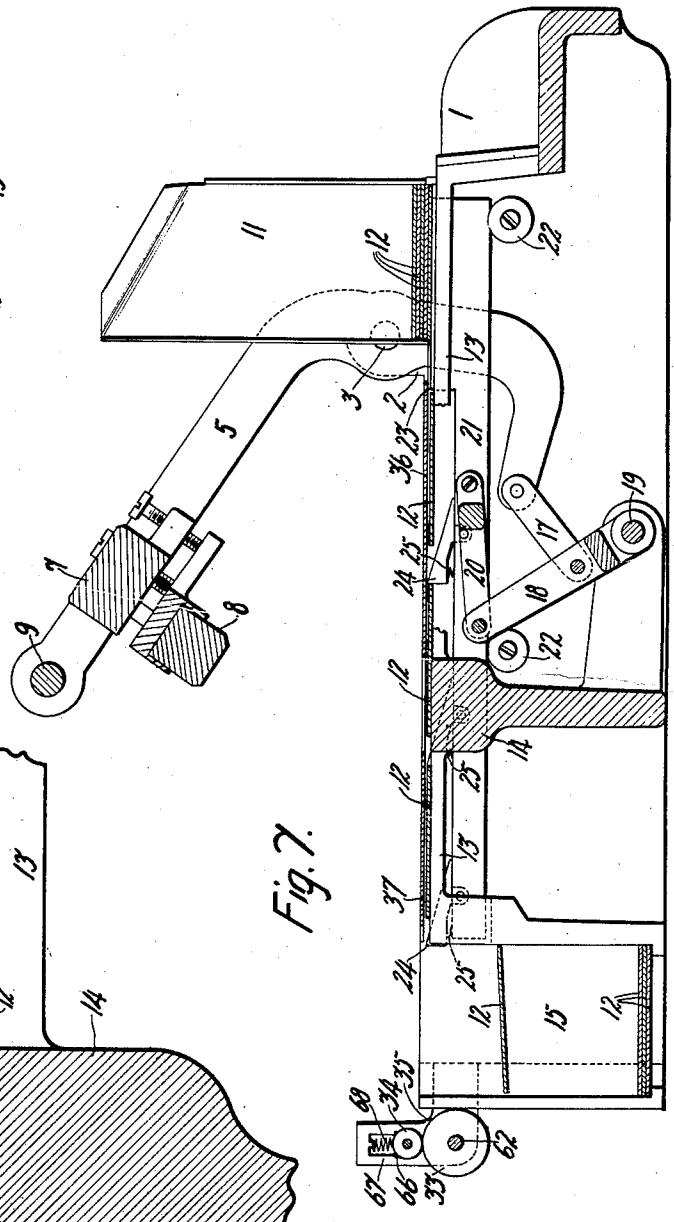


Fig. 7.

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July 13, 1926. 1,592,470

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MANIFOLD WEB PRINTING MACHINE

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Fig. 8.

D	C	B	A
INCOME LEDGER COPY	CUSTOMERS ADVICE	STATEMENT COPY	CREDIT TICKET
JOHN SMITH SMITHVILLE NEW YORK.	JOHN SMITH SMITHVILLE NEW YORK.	JOHN SMITH SMITHVILLE NEW YORK.	CREDIT ACCOUNT NAMED BELOW JOHN SMITH SMITHVILLE NEW YORK.
JOHN DOE DOEVILLE NEW YORK.	JOHN DOE DOEVILLE NEW YORK.	JOHN DOE DOEVILLE NEW YORK.	JOHN DOE DOEVILLE NEW YORK.

CHECKED BY | AUTHORIZED | DATE OF ENTRY | INTEREST BEGINS | AMOUNT CREDIT

PAR VALUE HELD $

Fig. 9.

Fig. 10.

Inventor:
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Patented July 13, 1926. 1,592,470

UNITED STATES PATENT OFFICE.

JESSE A. B. SMITH, OF STAMFORD, CONNECTICUT, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

MANIFOLD-WEB-PRINTING MACHINE.

Application filed April 14, 1923. Serial No. 631,956.

This invention relates to the construction of manifold-web-printing machines, and also to methods of using the same, both in connection with typewriting machines and independently thereof.

In banks and other business concerns, it is necessary to communicate with many persons repeatedly. Each such communication may comprise matter of three kinds: first, matter which is the same for all of the communications to all of the persons, and which may therefore be printed upon the communications by the use of an ordinary printing press; second, matter, such as the name and address of a person, which is the same for all communications sent to him, and which may therefore be individually printed in the communications; and, third, matter individual to each communication, which must be typed or penned.

In certain classes of work it is desirable to prepare a set of communications or memoranda, one for each of several departments, in connection with each of these communications to a customer. It has been the practice heretofore to print on an ordinary press a suitable group or set of forms for this purpose, said forms attached side by side to form a web or strip, and then to print each form of the strip with the same matter at a separate printing operation; a type-plate being usually retained in printing position until all of the forms of the strip had been brought successively to printing position and separately printed. The forms of such a strip or set were thereafter typed, the same matter being typed on all of them.

In accordance with the present invention, all of the forms of each strip or set may be manifolded by the use of interleaved carbons and this without separately interleaving the carbons for each set; and they may thereafter be all typed. To this end, the forms which are to constitute the customer's communication and the related memoranda are made as a web or strip, the forms being connected to one another at their sides, but a novelty is introduced in forming the strip, since the forms are printed alternately upon the front and back of the strip.

The strip is fan-folded, and is so printed upon its opposite sides as to cause the superposed forms to face the same way. The folds determine a definite superposed relationship of the forms. All of the forms of a strip are manifolded by a printing plate and the use of interleaved carbons. All the forms on the fan-folded strip are thereafter typed by the use of interleaved carbons. The folds are effective to locate the forms in the same relative positions for each of these operations, so that the printed and typed characters are caused to occupy the same relative positions on all of the forms. The manifolding of all of the forms of a set while connected is an important feature, not only because of the economy of time and labor in the manifolding operation itself, but because the accurate registry of the printed matter, thus obtained and preserved, also makes possible the typing of all of the forms manifoldly.

A further important feature of the invention relates to the rapid and convenient interleaving of the carbons between the successive sets of forms in both manifold printing and manifold typing. For this purpose the sets of strips of forms are connected end to end, being printed on successive sections of a long fan-fold web. The complete work-web thus formed consists of a plurality of long superposed work plies joined side to side and each having a series or repetition of identical forms printed on it. The arrangement of the sets of forms as integral parts of a continuous work-web makes unnecessary the separation of the carbons from each set of forms typed or printed, and the placing of the carbons individually between the forms of the next set to be operated upon.

A set of carbons gripped by a carbon holder, is interleaved between the forms of the first set at the head or leading end of the work-web, this set of forms is located in printing position, and all of the forms of the set are manifolded through the carbons. Af-

ter the manifolding of the first set of forms, a fresh type-plate is located in printing position. The work-web is moved toward the front of the machine while the carbons are held stationary, and this brings the next set of forms on the web into printing position and into co-operation with the carbons. The second set of forms is then printed with the second type-plate, and the web is again advanced and the type-plate changed, this cycle of operations being repeated until all of the required sets of forms have been manifolded.

The first set of forms at the leading end of the printed web is then interleaved with carbons in a fan-fold typewriting machine of the type disclosed in the patent to Wernery & Smith, No. 1,132,055, dated March 16, 1915, and the sets of forms are typed successively, the typing being done on all of the forms of each set by means of the interleaved carbons. The carbons are shifted relatively to the work-web to cause them to cooperate with successive sets of forms, according to the usual practice in machines of this type. After each set of forms is typed, it is separated from the continuous web, but the several forms of the set are kept connected to each other until the work has been checked and other steps, which may be required prior to the distribution of the forms, have been performed, and their performance has been indicated by penned entries on one of the forms. The forms on which these entries are penned may be wider than the other forms to provide additional space for the entries.

The arrangement of the work in continuous web form is advantageous independently of the manifolding feature, that is, as applied to single ply work. It enables the work to be conveniently fed to the addressing machine by automatic means, facilitates the feeding of the work to the typewriting machine, and mechanically keeps the forms arranged for the typist in the same order in which they are printed. In connection with the last-mentioned advantage the feeding of the work to the addressing machine from rear to front is an important feature.

The printing plates may be arranged and kept in a definite order by the operator, say in alphabetical order. The memoranda from which the variable matter is typed onto the printed web may be arranged in similar order by the typist. The work-web is necessarily fed to the typewriter from rear to front. The feeding of the printed web to the addressing machine from rear to front therefore causes the forms to be stamped from the type-plates in the same order in which they will be typed from the memoranda, and not in the reverse order.

A further feature of the invention relates to the forms in which the continuous web is supplied to the addressing and typewriting machines. The end of the printed web which is first fed to the addressing machine must be fed first to the typewriting machine, for otherwise the typewriting would be up-side down with reference to the printed matter. It is desirable, therefore, to avoid winding the work-web onto a reel between the operations of the addressing and typewriting machines, because that would render the leading edge of the printed work-web inaccessible at the center of the reel. To this end the printed work-web is cross-folded back and forth to make a work-pack (as shown in Figure 10), from which it is fed to the addressing machine. The printed web naturally assumes this same form at the discharge side of the addressing machine, and therefore its leading edge is accessible and may be fed directly to the typewriting machine.

In accordance with one feature of the invention, provision is made in an addressing machine of automatic means for feeding the work-web through the machine step by step from rear to front. Means is provided for adjusting the extent of the web feed according to the length of the forms in use, to cause each succeeding set of forms to be located uniformly in printing position.

Another feature consists in the provision of carbon-holding means in the addressing machine for holding carbons interleaved with the work-webs while in printing position. Such carbon-holding means preferably comprises a base and carbon-holding blades mounted on the base and arranged to extend across the path of the manifold work-web alternately from opposite sides of the base into the folds formed by the plies of the web.

The carbon-holder is adjustable upon the main frame of the machine to bring different portions of the carbon-sheets held by it into effective position, convenient means being provided to feed the holder along for this purpose. The carbon-holder remains stationary except when moved by the operator, but the work-web is automatically advanced to bring a fresh form to printing position, and the type-plates are automatically fed to bring a new plate to the printing position at each operation.

Other features of the invention relate to novel step products resulting from the practice of the method disclosed.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a side elevation of a multiple-addressing machine having the present improvements applied thereto.

Figure 2 is a transverse vertical section on the line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is a detail horizontal sectional view, showing the means for adjusting the extent of the work-web feed.

Figure 4 is a plan view of the machine.

Figure 5 is a horizontal sectional view taken above the top of the main frame of the machine.

Figure 6 is a fragmentary vertical longitudinal section through the machine, showing the carbon-holder with the plies of work-web threaded through it and interleaved with the carbons carried by it.

Figure 7 is a vertical longitudinal section of the machine, showing particularly the type-plate-feeding mechanism.

Figure 8 is a portion of the work-web as it would appear if unfolded after being passed through the addressing machine.

Figure 9 is a view on a larger scale than Figure 8 of a portion of the work-web in fan-fold formation as it is fed to both the addressing and typewriting machines.

Figure 10 is a diagrammatic view, showing the manner in which the fan-fold web is fed to the addressing machine and accumulated at the discharge side thereof.

Figure 11 is a diagrammatic view indicating the steps in the combination of manifold printing and typing.

The multiple-addressing machine comprises a hollow main frame 1 having upstanding bearing ears 2 in which are mounted shafts 3 and 4 for pivotally supporting arms 5 and 6, respectively, of a swinging platen-frame 7. The platen-frame 7, which carries an adjustable platen 8, is swung to effect printing by a handle 9 and is returned by a spring 10 connected to the platen-frame 7 and to the main frame 1. A type-plate magazine 11, open at the bottom, is mounted above the main frame 1 at the rear, and the plates 12 are fed forward one by one from the bottom of the stack in the magazine 11 along rails 13 (see Figure 7) to printing position above a printing bed 14, suitably attached to the main frame 1, and thence to a discharge magazine 15 at the front of the machine. The arm 5 of the platen-frame 7 is extended beyond its pivot through an opening 16 in the main frame to the interior thereof, and is connected through a link 17, swing-frame 18 pivoted on the main frame at 19, and a second swing-frame 20, to reciprocate horizontal type-plate feeding bars 21, which rest upon and are guided by rolls 22 mounted in the main frame 1. Each of these plate-feeding bars 21 has a shoulder 23 near its rear end for engaging the bottom type-plate in the magazine 11 to give it its first feeding step toward printing position, and each bar 21 also carries a series of pivoted plate-feeding pawls 24 upheld at their plate-engaging ends by springs 25 for imparting successive feeding steps to the plates 12. The arrangement is such that the plates 12 are fed forward on the up stroke of the platen-frame and are caused to remain stationary during the down stroke thereof.

The devices commonly employed in addressing machines for preventing over-feeding and retrograde movement of the type-plates may be used, but are not shown herein, because they are not necessary to an understanding of the present invention.

A ribbon 26 is fed up through openings 27 in the top of the main frame 1 and across the top of the printing bed 14 to lie between the type-plate 12 and the work-web in printing position. Any suitable means may be employed for automatically and reversibly feeding the ribbon, such, for example, as the ribbon-feeding means disclosed in the patent to Duncan, No. 1,209,403, dated December 19, 1916.

The work-web W consists of a plurality of plies A, B, C and D arranged in fan-fold formation. Each ply has a printed form repeated upon it throughout its length, and the laterally aligned forms on the several plies taken together form sets arranged to be addressed and typed together. The continuous fan-fold web W is cross-folded back and forth to make a neat compact work-pack (see Figure 10), and is fed to the addressing machine from the rear thereof over guide rolls 28 and 29 journaled in brackets 30 at the upper end of the plate magazine 11, thence down around a roll 31 journaled in brackets 32 on the main frame, and thence forward past the printing position and between work-web-feeding rolls 33 and 34 mounted in brackets 35 at the front of the main frame 1. Thin shield plates 36 and 37 prevent engagement of the work-web W and plates 12, except when they are in printing position and the platen 8 is actuated for printing, to prevent smearing of the web as it is fed relatively to the plates.

Between the roll 31 and the printing position, there is provided a carbon-holder 38 for holding carbon-sheets interleaved with the plies of the work-web W. This holder comprises a base 39 and a series of carbon-blades 40, each with a co-operating carbon-gripping clip 41 pivoted thereto, said blades 40 extending alternately from opposite sides of the carbon-holder base 39 across the path of the work-web, so that the first or lowest carbon-blade may extend from one side of the carbon-holder base 39 into the fold formed by the first and second plies A and B of the work-web W, and the second blade may extend from the opposite side of the carbon-holder base into the fold formed by the second and third plies B and C of the work-web, and so on.

It can be seen that when the work-web W is fed, form by form, from rear to front,

by means hereinafter described, the carbons 47, interleaved between a set of superposed forms, will be stripped from the forms of a set just printed and interleaved with the forms of the next succeeding set as the printing proceeds.

The carbon-blades 40 and clips 41 may be like those disclosed in Patent No. 1,191,352, granted to me July 18, 1916, and may be removably mounted on the base of the carbon-holder in the manner shown in that patent.

The carbon-holder 38 is provided with rolls 42 which run upon rails 43 mounted at opposite sides of the main frame 1. At its left side (see Figure 5), the carbon-holder 38 carries a rack 44 having teeth 45 which cooperate with a pawl 46 to prevent the advance of the carbon-holder with the work-web W and to feed the carbon-holder when it is desired to bring a fresh portion of the carbon-sheets 47 to printing position. The pawl 46 is mounted on an arm 48 of a bell-crank 49 and is urged toward the rack 44 to engage therewith by a spring 50 connected to the tail of the pawl 46 and to the bell-crank 49. Said bell-crank 49 is mounted to swing about a vertical pivot 51 on the main frame 1 through a limited range between stops 52 and 53 on the main frame, and is provided with a finger-piece 54 for swinging it toward the stop 52. A spring 55 normally maintains the bell-crank 49 in engagement with the other stop 53.

The operation of the pawl 46 through the finger-piece 54 causes the carbon-holder 38 to be moved to bring a fresh portion of the carbons 47 to printing position. The pawl 46 is provided with a finger-piece 56 for withdrawing it from engagement with the rack 44 to permit the return of the carbon-holder 38 to initial position when desired, for example, when a fresh set of carbons has been inserted in the carbon-holder. The feeding of the work-web W from the rear to the front of the machine enables the operator to observe through the topmost ply D of the work-web the impression made by the carbon, and thereby keeps him informed as to the condition of the carbon-sheets in use, so that he will know when to feed the carbon-holder 38 along.

The work-web W is led from the printing position forward between rolls 33 and 34 mounted in brackets 35 at the front of the machine. The shaft 4, on which arm 6 of the platen-frame 7 is mounted, is fast to said arm and is rocked by it. A crank-arm 57 having a slot 58 is fast upon the shaft 4, and through a link 59 oscillates a gear-segment 60 pivoted on one side of the main frame 1. The gear-segment 60 has a one-way driving connection with the feed-roll 33 through a pinion 61 loosely mounted on shaft 62 of the feed-roll 33, an arm 63 fast to the pinion 61, a pawl 64 on the arm 63, and a ratchet 65 fast to the feed-roll shaft 62, the pawl 64 being spring-pressed into engagement with the ratchet. The arrangement is such that the feed-roll 33 is driven to feed the work W on the up stroke of the platen-frame 7 which is the spring-actuated stroke, but is caused to remain idle during the down stroke thereof. The roll 34 is pivotally mounted in blocks 66 which are slidable vertically in guides 67 and which are urged downward toward the feed-roll 33 by springs 68 to cause the work-web W to be gripped between the rolls 33 and 34 for feeding. Both feed-rolls 33 and 34 extend entirely across the work-web W and tend to feed the work-web uniformly. They are arranged to feed the web exactly at right angles to the printing line. It is not necessary, therefore, for the typist, when the web is later passed through a fan-fold typewriting machine, to align each form individually, because the gages of the typewriting machine will cause the web to be fed through that machine exactly at right-angles to the printing line also.

The extent of the web-feeding strips may be adjusted very accurately to cause the work to be advanced exactly the length of a work-farm at each printing operation, by adjusting the connection of the link 59 and crank 57 toward and from the pivot of the crank. This adjustable connection is effected through a headed bolt 69 which passes through the slot 58 in the crank and through a round opening 70 in the link 59, and which is threaded into a knurled nut 71 having a reduced portion 72 extending into the opening 70 in the link. This reduced portion of the nut 71 forms a bearing for the link 59, and co-operates with the head of the bolt 69 in gripping the crank 57 to fix the position of the nut and bolt upon the crank. The crank 57 has suitable graduations 73 to indicate the length of feed corresponding to the various adjustments, and the link 59 is provided with a pointer 74 to be used in conjunction with said graduations.

While the machine is capable of a wide variety of uses, the following typical example will serve to indicate one of its uses. A security company holds bonds for a number of its customers, and, from time to time, as the interest installments are due, sets of forms are filled out ready for distribution to inform the customers and several departments of the company that the customers' accounts have been credited with this interest. A set of forms may comprise a customers' advice form to be mailed to the customer, and an income ledger copy, a statement copy, and a credit ticket to be retained by the company for the use of its

various departments, each of these forms being printed on a separate ply of a continuous fan-fold web.

A series of type-plates 12 is placed in the magazine 11 of the addressing machine, the work-plies are interleaved with the carbon-sheets 47 carried by the carbon-holder 38, and each set of forms is manifolded at a single operation by one of the plates with the customers' address and any other matter which is capable of being plate-printed until all of the required forms have been printed. The operator merely swings the platen-frame by the handle 9 to print the manifolds, and the plates and work-web are automatically led forward by the machine at each up stroke of the platen-frame. The printed portion of the work-web is then torn off. These plies are then interleaved with the carbons of a fan-fold continuous billing machine of the type shown in the patent to Wernery & Smith, referred to above, and the variable matter which could not be efficiently plate-printed is typed on the forms, the sets being fed to the typewriter in the same order in which they were addressed, and each set being separated from the continuous web as completed. The memoranda from which this variable matter is copied are arranged in the same order as the type-plates. A typist may therefore tear off the finished portion of the web from time to time and always find the manifolded forms in the proper order and forming a continuation of the work already completed.

The credit ticket may be considerably wider than the other plies of the work-web and may have printed spaces headed "Checked by", "Authorized", "Date of entry", "Interest begins" and "Amount of credit", which are filled in by pen before the forms of the set are distributed. The connecting lateral edges of the forms are not severed therefore until after these steps have been performed. By keeping the forms thus connected until they are ready for distribution, loss and confusion of the forms is mechanically prevented and mistakes are avoided.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. A method of preparing a series of communications or memoranda, which consists in feeding a series of connected previously printed forms to an addressing machine, addressing or individually printing said forms in a definite order, and thereafter feeding said forms to a typewriting machine in the same order and typing a further entry on each form according to the individual matter printed thereon.

2. A method of preparing a series of communications or memoranda, which consists in feeding a series of connected previously printed forms to an addressing machine, addressing or individually printing said forms in a definite order, and thereafter feeding said connected forms to a second machine and making further entries upon the forms corresponding to the matter addressed by the first machine.

3. A method of differently filling out previously printed forms of an identical series, which consists in feeding said forms in succession to an addressing machine, addressing each successive form with a different type-plate, and thereafter typing further matter upon the forms, such typed matter corresponding to the address printed upon the respective forms.

4. A method of preparing a series of communications or memoranda, which consists in feeding to an addressing machine, from rear to front, a continuous work-web having a series of identical forms printed upon it, printing each form with a different address, inserting in a typewriting machine the end of said continuous web which was first fed to the addressing machine, and feeding said web through the typewriting machine from rear to front and at the same time typing additional matter on the forms according to the matter previously printed upon them.

5. A method of preparing a series of communications or memoranda, which consists in feeding a continuous web, having a series of identical forms printed thereon, to an addressing machine, addressing each form, and thereafter feeding the web to a typewriting machine in the same direction in which it was fed to the addressing machine and at the same time typing additional matter on each form.

6. A method of preparing a series of communications or memoranda, which consists in feeding a continuous previously printed web to an addressing machine to have printed thereon matter which is capable of being plate-printed, and then feeding said web to a typewriting machine to have additional matter typed thereon.

7. A method of preparing a series of communications or memoranda, which consists in feeding a continuous previously printed web to an addressing machine exactly at right angles to the direction of the lines printed by the machine, printing sections thereof in succession, and then feeding said web to a typewriting machine exactly at right angles to the line of writing to have additional matter typed thereon in parallelism with the lines printed by the addressing machine.

8. A method of preparing a series of communications or memoranda, which consists in providing a series of identical printed

forms upon a continuous work-web, folding said work-web back and forth transversely of its length to form a compact work-pack, feeding said web to an addressing machine to print each form, accumulating said web at the discharge side of said addressing machine in its original cross-folded form, so that the end of the web which was first fed to the addressing machine will be accessible, and thereafter again feeding said web to a second machine in the same order in which it was fed to the addressing machine to make further entries upon the forms.

9. A method of preparing a series of communications or memoranda, which consists in providing a series of identical printed forms upon a continuous work-web, feeding said web to an addressing machine, addressing each form, accumulating said web without winding at the discharge side of said addressing machine, so that the end of the web which was first fed to the addressing machine will be accessible, and thereafter feeding said web to a typewriting machine in the same order in which it was fed to the addressing machine and making further entries upon the forms.

10. A method of preparing a plurality of communications or memoranda, which consists in feeding a continuous work-web, having a series of identical forms printed upon it and connected end to end, to an addressing machine from rear to front, printing the successive forms, each with a different plate of a series of type-plates arranged in definite order, and thereafter making further entries on each of said forms from memoranda arranged in the same order as the plates.

11. A method of filling out a plurality of related forms, which comprises providing a set of such forms connected edge to edge and fan-folded to form a plurality of work-plies, interleaving carbon between said plies, and manifolding all of said plies of the set with a type-plate.

12. The method of first printing and then typing a succession of related printed forms constituting a multiple-ply work-web, which includes interleaving the forms with carbons, impressing printed matter at one operation in a printing machine upon said forms in succession, and simultaneously duplicating each impression by means of the carbons, stripping the carbons from form to form as the printing proceeds, again interleaving the forms with carbons, typing manifoldly on said forms, again stripping the carbons from form to form as the typing proceeds, and severing the forms from the web.

13. The method of impressing data upon a succession of related previously printed sets of superposed forms constituting a multiple-ply work-web, including interleaving a set of the superposed forms with carbons, impressing the required data in an impressing or printing machine at one operation for each set of the superposed forms, the data being impressed upon the sets of forms in succession, and stripping the carbons from form to form as the impressing of the successive sets proceeds, with the web preserved whole for subsequent typing.

14. The method of impressing data upon a succession of related previously printed sets of forms, constituting a multiple-ply work-web, which includes arranging said work-web in a fan-folded work-pack at the rear of an addressing machine, intermittently feeding said web through said machine from rear to front, interleaving the superposed forms with carbons, impressing data upon each set of superposed forms at one operation in said machine, the impressions proceeding from set to set as the web feeds through the machine, and stripping the carbons from form to form as the printing proceeds, with the web preserved whole for subsequent typing.

15. A method of preparing a plurality of related communications, which consists in locating a plurality of superposed work-plies in printing position in an addressing machine, with carbon interleaved, manifolding the same matter on all of said plies, and thereafter locating said plies in superposed relation, with carbon interleaved, in typing position in a typewriting machine, and manifoldly typing on all of said plies.

16. The method of impressing data upon a succession of related previously printed sets of superposed forms constituting a multiple-ply work-web, including interleaving a set of the superposed forms with carbons, impressing the required data in an impressing or printing machine at one operation for each set of the superposed forms, the data being impressed upon the sets of forms in succession, stripping the carbons from form to form as the impressing of the sets proceeds, again interleaving a set of the superposed forms with carbons, typing data manifoldly on the superposed forms in a typewriting machine, the data being typed upon the sets of forms in succession, again stripping the carbons from form to form as the typing of the sets proceeds, severing each set of typed forms from the web with all the forms of a set being kept connected together, and writing by hand on part of the forms of a set before the forms are separated.

17. The method of impressing data upon a succession of related previously printed sets of forms constituting a multiple-ply work-web, which includes arranging said work-web in a fan-folded work-pack at the rear of an addressing machine, intermittently feeding said web through said machine from rear to front, interleaving the

superposed forms with carbons, impressing the required data upon each set of superposed forms at one operation in said machine, the impressions proceeding from form to form as the web is fed through the machine, stripping the carbons from form to form as the impressing of the data proceeds, arranging said work-web in a fan-folded work-pack as it comes from the delivery end of said machine, so that the leading end of the web is accessible, feeding the leading end of said work-web through a typewriting machine, interleaving carbons with said forms, manifoldly typing data on each set of the superposed forms in said typewriting machine, the data being typed upon the sets of forms in succession, stripping the carbons from form to form as the typing proceeds, severing each set of forms from said work-web as the forms are manifoldly typed so as to keep all the forms of a set connected together, and writing by hand on part of the forms of a set before the forms are separated.

18. A method of preparing a set of related communications, which consists in providing a set of superposed work-plies, manifolding all of said plies from the same type-plate, mechanically maintaining the plies superposed with the printed matter on the plies in register, and manifoldly typing on all of said plies.

19. A method of preparing a series of related communications, which comprises providing a set of superposed connected work-plies, manifolding all of said plies, storing said plies in connected form until their distribution is authorized, writing by hand on one of said plies, and thereafter severing the plies and distributing the communications.

20. A method of preparing a series of sets of related communications, all of the communications of the series comprising certain matter in common which is repeated in each set prepared, which method comprises preparing a type-plate of all of said common matter, and, in the preparation of each set of the series, interleaving carbon with a plurality of work-plies, and manifolding said common matter upon all of the plies by means of the carbon.

21. A method of preparing a series of sets of related communications, which comprises providing a continuous fan-fold work-web with carbon interleaved between the plies of the web, feeding the web past the printing position of an addressing machine, printing successive sets of the web with different type-plates, so that all of the plies of the web will be manifolded with the same printed matter, feeding the continuous fan-fold web to a fan-fold typewriting machine, typing on the successive sets with carbon interleaved, so that manifold typed matter will appear on all of the work-plies of the set, and separating each set from the continuous web as typing upon each set is completed.

22. A method of preparing a series of sets of related communications, which comprises providing a continuous work-web fan-folded to provide a plurality of work-plies, each ply having a series of forms printed upon it, interleaving carbon with said plies, printing on each set of the plies, separating the carbon from the set of plies printed upon, maintaining the sets connected to each other, again interleaving carbon with the sets, and printing on each set of the plies matter of a different character from that first printed.

23. A method of preparing a series of sets of related communications, which comprises providing a continuous work-web fan-folded to provide a plurality of work-plies, interleaving carbon with a set of work-plies, manifolding upon said set of work-plies by means of said carbon, moving the work-plies and carbon relatively to bring the carbon into interleaved relation with a second set of work-plies, and printing upon said second set of work-plies.

24. A method of preparing a series of related communications, which comprises providing a continuous work-web fan-folded to provide a plurality of superposed work-plies, interleaving carbon with a section of the work-plies, locating a type-plate in position to print said work-web section, printing said section of all of the work-plies by means of said carbon, maintaining the carbon stationary, while locating a different type-plate in position to co-operate with the carbon, and while moving the work-web to locate a second section thereof in position to be printed through the carbon, and printing said second section of all of the work-plies.

25. A method of preparing a series of related communications, which comprises providing a continuous work-web fan-folded to provide a plurality of superposed work-plies, interleaving carbon with a section of the work-plies, relatively moving the carbon and the work-web to locate the carbon between different sections of the plies, manifolding successive sections of the web through the carbon, interleaving the addressed portion of the web with other carbon, relatively moving the carbon and the work-web to locate the carbon between different sections of the plies, and typing the successive sections of the web through the carbon.

26. A method of preparing a series of related communications, which comprises providing a continuous work-web fan-folded to provide a plurality of superposed work-plies, interleaving carbon with a section of

the work-plies, relatively moving the carbon and the work-web to locate the carbon between different sections of the plies, manifolding successive sections of the web through the carbon, interleaving the addressed portion of the web with other carbon, relatively moving the carbon and work-web to locate the carbon between different sections of the plies, typing the successive sections of the web through the carbon, severing the web-sections from the web as completed, checking the work, and then separating and distributing the work-plies.

27. A method of preparing a series of related communications, which comprises providing a continuous work-web fan-folded to provide a plurality of superposed work-plies, interleaving carbon with an end section of the work-plies, relatively moving the carbon and the work-web step by step to locate the carbon between successive sections of the plies, addressing all of the plies of each section by means of the carbon, interleaving with other carbon the same end section of the web which was interleaved with the first carbon, relatively moving the second carbon and work-web step by step to locate said carbon between the successive addressed sections of the plies, and manifoldly typing all of the plies of each section by means of the carbon, the sections being typed in the same order in which they were addressed.

28. A method of preparing a series of related communications, which comprises providing a continuous work-web fan-folded to provide a plurality of superposed work-plies, said fan-folded web being cross-folded to form a compact work-pack, interleaving carbon with an end section of the work-plies, relatively moving the carbon and the work-web step by step to locate the carbon between successive sections of the plies, addressing all of the plies of each section by means of the carbon, accumulating the web in cross-folded form as it is addressed, interleaving with other carbon the same end section of the web which was interleaved with the first carbon, relatively moving the second carbon and the work-web step by step to locate said carbon between the successive manifolded sections of the plies, and manifoldly typing all of the plies of each section by means of the carbon in the same order in which they were addressed.

29. A method of preparing a series of sets of related communications, which consists in providing a plurality of continuous work-plies, each having a series of forms repeated thereon, the forms on the several plies being of equal length, superposing the plies with the forms thereof in register, addressing the forms on each registering set, feeding the webs to a continuous billing typewriter with the address matter in register, typing on successive sets of forms, and, while so doing, feeding all of the superposed plies equally through the machine.

30. In an addressing machine, the combination with a printing bed and instrumentalities arranged for impressing printed matter on sets of previously printed superposed forms constituting a work-web, the sets being printed one at a time in succession, carbons being interleaved between the superposed plies of a set of forms at the printing position of said machine, of means for stripping the carbons from form to form as the printing proceeds, said means including a stationary blade held between each two adjoining plies of said web in the rear of said printing position, each blade having a carbon-sheet fastened thereto, and feed-rolls arranged for feeding said work-web from rear to front, form by form.

31. In an addressing machine, the combination with a printing bed and instrumentalities arranged for impressing printed matter on sets of superposed forms constituting a multiple-ply work-web, the sets being printed one at a time in succession, carbons being interleaved between the superposed plies of a set of forms, of automatic means for stripping said carbons from one set of forms to the next succeeding set as the printing proceeds.

32. In an addressing machine, the combination with a main frame, a type-plate magazine at the rear end thereof, a printing bed on said frame forward of said magazine, and a platen reciprocable toward and from said printing bed for impressing printed matter on sets of superposed forms constituting a multiple-ply work-web, said sets being printed one at a time in succession, of rollers arranged on said machine for passing said work-web from the rear of said magazine over its top to said printing bed, carbons being interleaved between the plies of a set of superposed forms, adjustable feed-roll means arranged for feeding said work-web, and means for stripping said carbons from form to form as the printing proceeds.

33. In an addressing machine, the combination with a magazine for type-plates, a printing bed forward of said magazine, and a platen reciprocable toward and from said printing bed for printing, one at a time, from said type-plates, sets of superposed forms constituting a multiple-ply work-web, of stationary blades for holding carbons interleaved between a set of said forms, means for feeding said sets of forms from rear to front over said printing bed, and means for stripping the carbons from form to form as the printing proceeds.

34. In an addressing machine, the combination with a main frame, a type-plate magazine, a printing bed on said frame forward

of said magazine, and a platen reciprocable toward and from said printing bed for printing one at a time, from type-plates, sets of previously printed superposed forms constituting a multiple-ply work-web, of a carbon-holder arranged in the rear of said printing bed for holding carbons interleaved between a set of said forms at the printing position of said machine, and web-feeding means including feed-rolls at the forward end of said frame arranged to feed said work-web from rear to front, form by form, to said printing position, so as to strip said carbons from a form to the next succeeding form upon the upward movement of said platen.

35. In a multiple-addressing machine, addressing means, and a carbon-holder for holding carbon interleaved with the plies of a fan-fold work-web, said holder comprising a base, a plurality of carbon-gripping blades mounted on said base, and means for moving the carbon-holder step by step to bring fresh portions of the carbon held by said blades to printing position.

36. In a multiple-addressing machine, addressing means, a carbon-holder arranged to hold carbon interleaved with a plurality of work-webs in printing position, and means for feeding the carbon to bring successive portions thereof to printing position.

37. In a multiple-addressing machine, addressing means, and a carbon-holder arranged to hold carbon interleaved with a plurality of work-webs in printing position, means for feeding the work through the machine from rear to front, and means for feeding the carbon-holder step by step from front to rear to locate successive portions of the carbon in printing position.

38. In a multiple-addressing machine, addressing means, a normally stationary carbon-holder, a carbon-sheet being held carbon side up by the holder in position to be interleaved with a plurality of work plies in printing position, means for feeding the work through the machine from rear to front, the arrangement being such that the operator may observe through the top ply the distinctness of the carbon impressions made upon said ply, and means for moving a fresh portion of the carbon-sheet to printing position when a portion of the carbon has been used up.

39. In a multiple-addressing machine, plate-holding means for holding type-plates in printing position, a platen co-operating with the type-plates to mark impressions on the work, and a ribbon guided between the platen and the effective position of the plates for marking the first work ply, a carbon being located between the platen and the effective position of the plates for marking another work ply at the same operation.

40. In a multiple-addressing machine, plate holding means for holding type-plates in effective position, a platen, a carbon-holder for holding carbon interleaved with work plies located between the plate-holding means and the platen for co-operation therewith, and means for moving the carbon-holder in short steps of mechanically regulated length to bring successive portions of the carbon to effective position.

41. In a multiple-addressing machine, plate holding means for holding type-plates in effective position, a platen, a carbon-holder for holding carbon interleaved with work plies located between the plate-holding means and the platen for co-operation therewith, and means for feeding the carbon-holder along to bring successive portions of the carbon to effective position, comprising a rack on the carbon-holder, a pawl normally engaging the rack and a finger-piece for operating the pawl to advance the rack.

42. In a multiple addressing machine, plate holding means for holding type-plates in effective position, a platen, a carbon-holder for holding carbon interleaved with work plies located between the plate-holding means and the platen for co-operation therewith, and means for moving the carbon-holder step by step to locate successive portions of the carbon in effective position, comprising a rack on the carbon-holder and a pawl normally engaged with the rack and operable to feed the rack, said pawl having a finger-piece to move it out of engagement with the rack to permit the rack, when it has been moved by the pawl, to be returned to initial position.

43. In a multiple addressing machine, plate holding means for holding type-plates in effective position, a platen co-operating therewith, work-feeding means for feeding a work-web between the platen and the plate-holding means, a carbon-holder adjustable to hold carbon with different portions thereof between the platen and the plate-holding means, means for retaining said carbon-holder in its various adjusted positions against advance with the work-web, and means for releasing the carbon-holder to permit it to be moved in the direction of travel of the work-web.

44. In a multiple-addressing machine, a platen, type-plate-holding means for co-operating with the platen, and a plurality of manifolding means between the platen and the plate-holding means for co-operation with the type-plates.

45. In a multiple-addressing machine, means for holding type-plates in printing position, type-plate-supplying means, means for feeding plates from the type-plate-supplying means to the type-plate-holding means, and means for causing a plurality of manifold impressions to be made.

46. In a multiple-addressing machine, a printing bed, a platen movable toward the printing bed to make printed impressions on a work-web, means for feeding type-plates horizontally to printing position over the printing bed from the rear of the machine, means for feeding the work-web horizontally to printing position between the platen and the printing bed from rear to front of the machine adjacent the path of the type-plates, and shield plates to prevent contact of the work-web with the type-plates except at the printing position.

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