

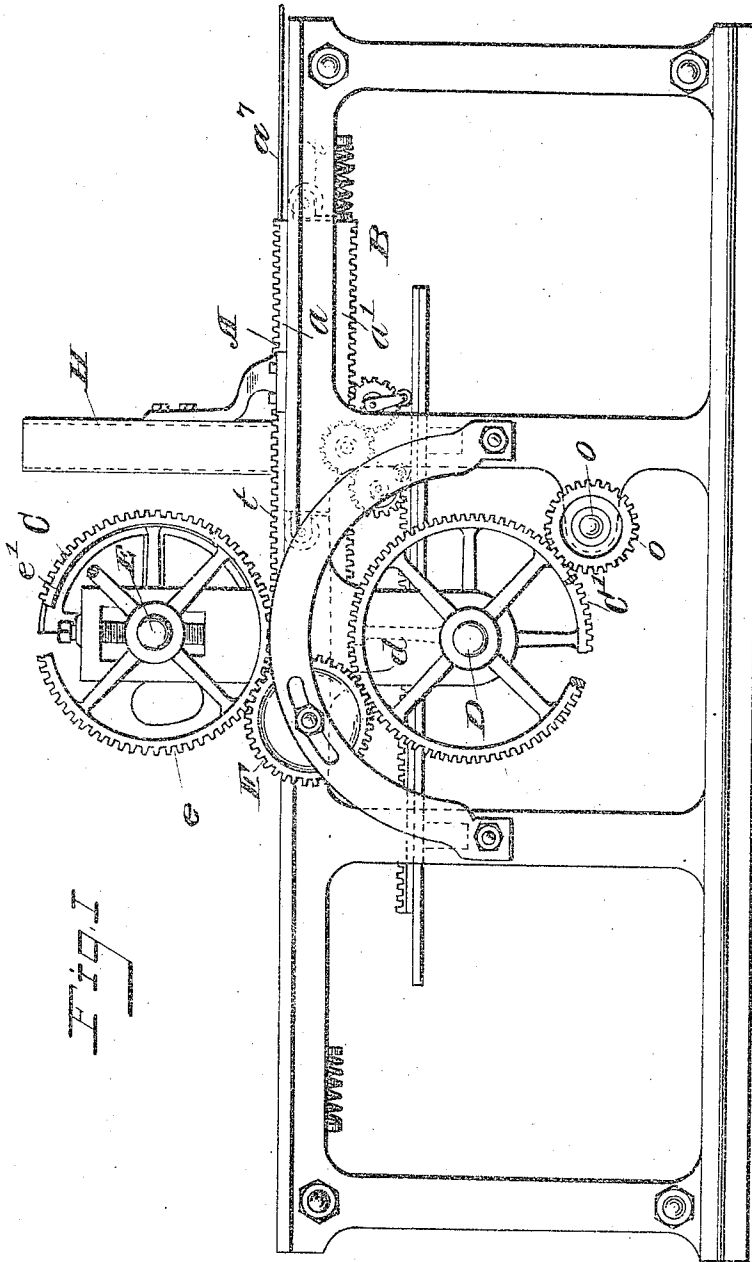
E. G. ERNST.  
ADDRESSING MACHINE.

APPLICATION FILED APR. 10, 1909. RENEWED SEPT. 8, 1910.

991,283.

Patented May 2, 1911.

4 SHEETS—SHEET 1.



Witnesses:  
J. C. Turner  
N. L. Freeman

Inventor:  
Edward G. Ernst  
by Thurston Woodward  
Attorneys.

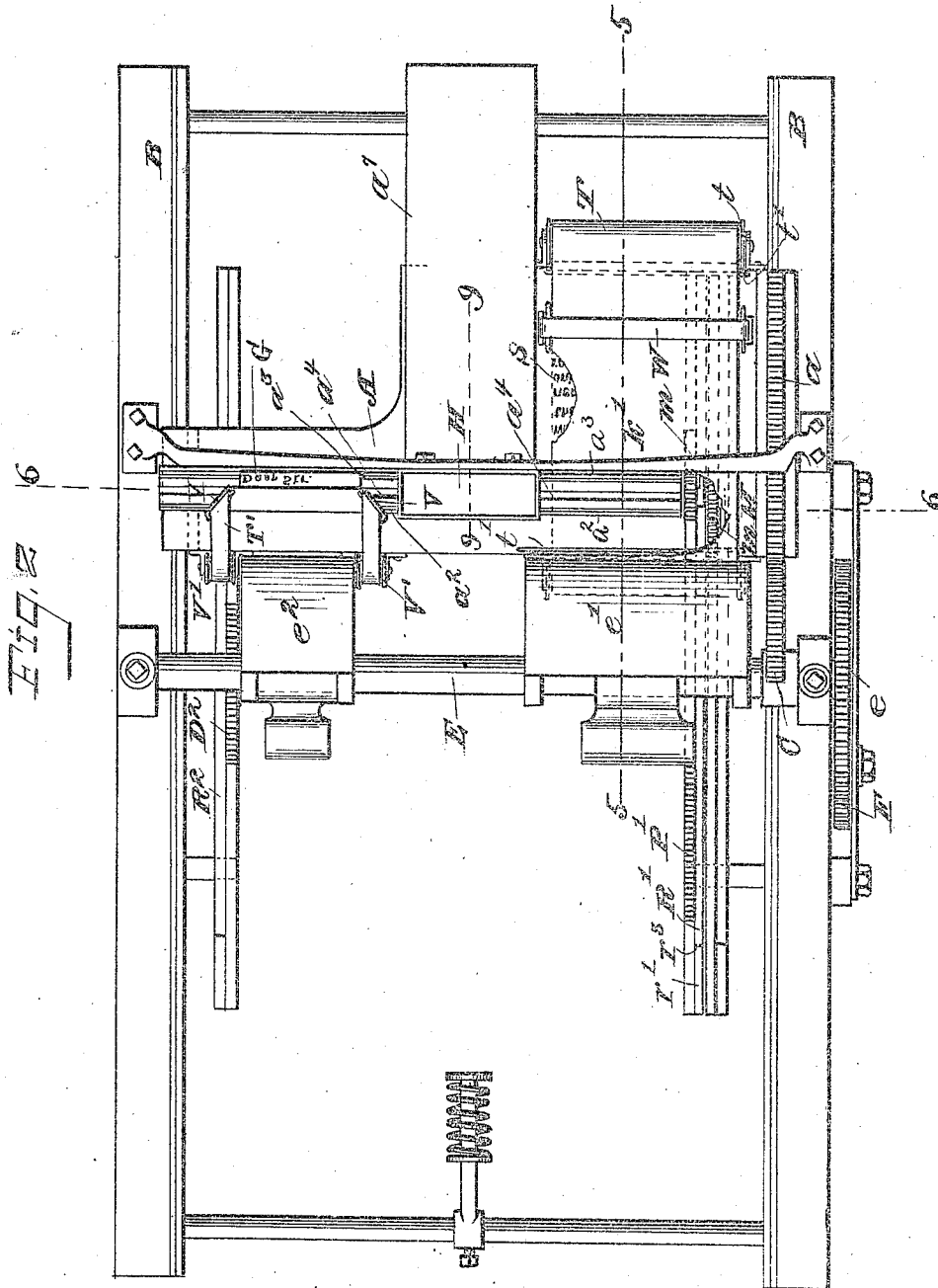
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4 SHEETS—SHEET 3.



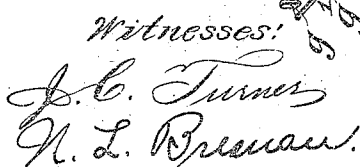
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

EDWARD G. ERNST, OF CLEVELAND, OHIO.

## ADDRESSING-MACHINE.

991,283.

Specification of Letters Patent.

Patented May 2, 1911.

Application filed April 10, 1909, Serial No. 489,153. Renewed September 8, 1910. Serial No. 581,096.

*To all whom it may concern:*

Be it known that I, EDWARD G. ERNST, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Addressing-Machines, of which the following is a full, clear, and exact description.

This invention consists of means, adapted especially for use in and as parts of a circular-letter printing machine, for successively printing on such circular letters the names and addresses of the parties to whom such letters are to be sent, and for also printing the names and addresses on the envelopes in which said circular letters are to be sent.

The invention is shown in the drawings embodied as part of a familiar type of printing or duplicating machine, viz., one having a reciprocating type-carrying bed and a rotating platen. But the invention may, obviously, be embodied in other types of printing machines; and some parts of it may even be embodied in a machine adapted to print the names and addresses on circular letters which were printed on an independent machine; and on the envelopes or on either.

The invention is also shown embodied in a machine in which all of the printing is done through inking ribbons, so that the matter printed shall simulate matter printed on a typewriting machine; but although some of the novel features relate to facilitating the use of such inking ribbons, the main novel features of the invention are equally well adapted for use in machines employing inking rollers or their equivalent; all of which will be plain from the following description and appended claims, read in connection with the accompanying drawings.

In the drawings, Figure 1 is a side elevation of a printing machine equipped with my invention, parts of the gears  $d$  and  $e$  and gear segment  $C$  being broken away to show parts which they hide. Fig. 2 is a plan view of the same. Fig. 3 is a plan view of the parts of the machine below the reciprocating bed, which bed is indicated by dotted lines. Fig. 4 is an end view, from the front side of the machine, of the feed screw and associated mechanism for operating it. Fig. 5 is a sectional side elevation of the machine in the plane indicated by line 5—5 on Fig. 2. Fig. 6 is a transverse sectional view

in the plane indicated by line 6—6 on Fig. 2. Fig. 7 is a rear view of the feed screw and its associated parts. Fig. 8 is a perspective bottom view of one of the address slugs; and Fig. 9 is a vertical sectional view through the feed screw, hopper and bed in the plane of line 9—9 on Fig. 2.

The printing machine shown includes a reciprocating type carrying bed  $A$  sliding in suitable ways on a frame  $B$ . This bed may be moved backward and forward by any suitable mechanism. As shown, the bed carries two racks  $a, a'$ , one directed upward and one downward; and two rotating gear segments  $C, C'$ , engage respectively with said racks,—one segment engaging with its rack just as the other becomes disengaged from its rack. One gear segment  $C$  is secured to the platen shaft  $E$ , and the other to a shaft  $D$ . Gears  $e$  and  $d$  secured to said shafts are operatively connected by the idler pinion  $F$ ; and the gear  $d$  meshes with a gear  $o$  on the driving shaft  $O$ .

Two counterweighted platens  $e', e''$ , are respectively secured to shaft  $E$  in position to cooperate, the one with the type form  $S$  near the front side of the bed and an address slug  $G$ , to print the letter and its address, and the other to cooperate with an address slug when it is near the rear side of the bed in position for printing the envelopes. Each platen has a cylindrical surface which, however, goes about half way around the shaft  $E$ , wherefore as the bed is moving forward, *i. e.* to the left, as shown in Fig. 1 of the drawing, the platen will cooperate with the type on the bed; but when the bed is moving backward the platen will be swinging through the upper part of its path and does not therefore interfere in any way with the said backward movement of the bed.

A hopper  $H$  is fixed in a position above the reciprocating bed and about midway between its sides. This hopper is designed to contain a supply of address slugs  $G$ , said slugs being plates of metal having the arrangement of letters constituting an address formed in relief on their top surfaces, and having projecting from their lower surfaces near the ends thereof the legs  $g, g'$ . The four legs marked  $g$  are located near the corners of the plate, and the legs  $g'$  are at the ends of the plate in line with the legs  $g$ , but about midway between.

In a raised part of the top of the bed and

extending from its rear edge, *i. e.* the top side of the sheet, as shown in Fig. 2, to near the front edge thereof, are two parallel grooves  $a^2$ ,  $a^3$ , which serve as guide-ways 5 which receive the legs  $g$ ,  $g$ , of a slug when dropped upon the bed from the hopper, and in which said slug will be guided as it is moved back and forth across the bed in the manner to be described. A transverse slot 10  $a^4$  is formed in the raised part of the bed plate and about midway between these two grooves. Below this slot is a transverse guide-way  $a^5$  in which a slug propeller  $J$  is slidably mounted. This propeller has on its 15 under side a half nut  $j$  which engages with a feed screw  $K$  mounted directly beneath it in bearings carried by the bed. On the bed is a longitudinally extended raised portion  $a^7$  terminating in an abrupt shoulder  $a^8$  at 20 a point just beneath the hopper when the bed has drawn back to the limit of its movement. When the bed moves forward, this shoulder by engaging with the lowest slug 25 pushes it out from the hopper, and the raised portion  $a^7$  passes beneath the hopper and supports the stack of address slugs  $G$  therein. When the bed is drawn back, however, to the limit of its movement this raised 30 portion passes from beneath the stack of slugs and the lowermost slug drops onto the bed, its legs entering the grooves  $a^2$ ,  $a^3$ , and slot  $a^4$ , and the legs  $g'$  going between two pins  $j^2$ ,  $j^3$ , which project up from the propeller  $J$  into the slot  $a^4$  in said bed. While 35 the forward movement of the bed is going on, and before the slug has been carried to the printing point beneath the platen, the feed screw rotates in that direction which moves the propeller  $J$  forward—that is toward the bottom of the sheet as the machine 40 is shown in Fig. 2, and said screw turns enough during this movement to so move the propeller that the slug will be moved forward to the position upon the bed in 45 which it is desired to have it printed in relation to the type form  $S$  secured upon the bed. When the slug has reached this position the screw ceases to rotate and the slug and type-form will then pass beneath the 50 platen  $e'$  and will print upon the paper placed upon them and below the platen. When the bed begins to move backward on its return stroke this feed screw will rotate 55 in the contrary direction, and thereby the slug will be carried backward across the bed to a position convenient for use in printing the address upon envelopes—that is to say, near the rear edge of the bed. The 60 parts are so arranged that the slug reaches this position when the bed has made about one-half of its return stroke. While moving toward this position the slug has been pushed by the fixed pin  $j^2$ . The pin  $j^3$ , however, is a movable pin under the influence of 65 a spring  $j^4$  tending to push it up into oper-

ative position, but having a laterally projecting head  $j^5$  on its lower end. This head, during the movement of the slug rearward and before the slug has passed much beyond the center of the bed engages with the cam 70 ribs  $a^6$ . Said pin  $j^3$  is drawn down out of engagement with leg  $g'$ . During the remaining portion of the backward movement of the bed, the screw rotates in the opposite 75 direction, and thereby the propeller is moved to its central position, to which place it arrives before the bed quite finishes the return movement. During most of this backward 80 movement the spring pin  $j^3$  is held down by said cam ribs, but is allowed to fly up just before the propeller reaches the central position. When, now, the bed begins its forward 85 movement these operations are repeated, the pin  $j^3$  being in a position to engage with the adjacent leg  $g'$  of the slug and push it forward.

Numerous devices for giving to the slug the back and forth movements described may be substituted for those shown, without departure from the broad invention. 90 In the construction shown, the feed screw  $K$  is turned as stated by the following mechanism. On the front end of the feed screw shaft two pinions  $k$ ,  $k'$  are secured. Hung 95 loosely on said shaft adjacent to the pinion  $k$  is an arm  $M$  in the outer end of which a pinion  $m$  is mounted meshing with the pinion  $k$ . Secured to the frame of the machine is a rack  $P$  with which the pinion  $m$  may engage as the bed is moving forward. 100 This rack only extends for a short distance, namely, that which the bed moves while the slug is being moved from the middle position toward the front edge of the bed into 105 the position for printing the address on a letter. Then the rack is discontinued and, of course, no further rotation of the feed screw can occur through that particular mechanism while the bed continues its forward movement. But if nothing were done 110 to prevent it, the pinion would engage said rack on the return movement of the bed, and thereby rotate the feed screw in the contrary direction. But since this would be fatal to the desired operation of the feed 115 screw, means are provided for lifting the pinion from and holding it above the rack during the return movement of the bed. With this end in view an arm  $N$  is pivotally 120 connected with the arm  $M$ , and it has in its lower end a roller  $n$  which normally rides on a straight rail  $R$  by the side of the rack  $P$ . On the arm  $N$  are two shoulders  $n'$ ,  $n''$ , and on the arm  $M$  is a pin  $m'$  lying between 125 said shoulders, whereby the movement of arm  $N$  about its pivot is limited. One extreme position which this arm may take is shown by full lines in Fig. 4, and when the arm is in this position, the pinion  $m$  is 130 allowed to engage with rack  $P$ . But when

the arm N occupies the position shown by dotted lines in said figure, and its roller  $n$  is riding on rail R, the pinion  $m$  is held above said rack. The rail R is made in two levels  $r, r'$ , the high level part being of a length slightly greater than the length of rack P, and being terminated at its ends by abrupt shoulders  $r^2, r^3$ . When the bed is going forward the roller  $n$  strikes the shoulders  $r^2$ , and the arm N is swung to the position shown in full lines in Fig. 4; and when it is in this position, the pinion  $m$  will engage the rack. But when the rack has been passed, the roller  $n$  drops onto the low level part  $r'$  of the rail so that when the bed makes its return movement the roller  $n$  will strike the shoulder  $r^3$ , and the arm N will be swung to the position shown by dotted lines in Fig. 4; wherefore when the roller rides up onto the high level part  $r$  of the rail the pinion  $m$  will be lifted above the rack P. The other stated movements of the feed screw are produced by similar mechanism. That is to say, the movement of the propeller J across the bed to the back side of the machine is produced by another rack P', and an associated two level rail R'. An arm M' hung loosely on the feed screw shaft carries a pinion  $m'$  meshing with pinion  $k'$ , an arm N' pivoted to the arm M' carries a roller  $n$  in its end. It will be understood that the length of the rack P' will be equal to the distance which the bed travels while the propeller is making its rearward movement across the bed of the machine, and that will be, perhaps, about one-half of the whole distance traveled by said bed. To impart to the propeller its rearward movement to the middle of the bed, another set of similar mechanism is employed connected, however, with the rear end of the feed screw shaft, and shown in Fig. 7. This mechanism includes an arm M<sup>2</sup> hung loosely on the feed screw shaft, an arm N<sup>2</sup> pivoted thereto and having a limited movement, a pinion  $m^2$  mounted on said arm M<sup>2</sup> and meshing with an interposed idler pinion  $m^3$  which meshes with the gear  $k^2$  on the rear end of the feed screw; and an associated rack P<sup>2</sup> of proper length and an associated two level rail R<sup>2</sup>. It will be understood that the relative size of the intermeshing pinions constituting these mechanisms and the pitch of the feed screw will be such as will, during the stated movements of the bed, impart the stated movements to the propeller.

As previously stated, the machine shown in the drawing is organized with special reference to using the same for the printing of circular letters in simulation of typewritten letters. Instead of using inking rollers therefor, inking ribbons are employed. One of these ribbons T may be secured at its ends to and wound upon two spools  $t$  mounted

ed upon the ends of the bed. From these spools the ribbon passes over two thin supporting bars  $t'$  and over the type form S and the address slug G which has been moved in proper relation thereto. This ribbon is to be kept fairly taut and the bars  $t'$  are of such height that they will hold the ribbon above the plane of the top surface of the address slug so that the same may easily move under the ribbon.

In the printing of circular letters it is desirable to be able to print the signature as well as the letter on the machine, but this cannot be done in a satisfactory way if the signature is to be printed in the same ink as the body of the letter. In order to enable the printing of the signature so that it may simulate pen writing, a narrow ribbon W is extended across the ribbon T above the same and directly over the electro-type of the signature, and the ends of the ribbon W are drawn through the bed and are attached to suitable devices for holding it in place. This ribbon may be a black ribbon, and therefore the signature when printed on the machine through this ribbon will appear black just as it would if written with a pen.

The address slugs have in addition to the name and address, the salutation "Dear sir" or its equivalent. When these slugs have been moved to the rear part of the bed so as to be available for printing the addresses upon envelopes, it is desirable that this salutation "Dear sir" or its equivalent shall not be printed. The inking ribbon T' employed for this purpose goes crosswise of the machine over the slug and is of such width that it only covers the name and address. This ribbon, after crossing this part of the slug, goes over the inclined guides V, V to opposite sides of the platen  $e^2$  to two ribbon spools V', V', which may be mounted upon the same shaft which is supported by the bed.

It will be clear from the foregoing that the front side of the bed may serve the purpose in coöperation with the associated parts, as described, of printing the letter, its address and signature, and that the grooves  $a^2, a^3$ , in said part of the bed constitutes the means for holding the address slug thereon in the printing position. The rear side of the bed and its associated parts constitute the envelop printing mechanism, and the grooves  $a^2, a^3$  therein constitute the means for holding the address slug thereon in the printing position. The part  $a^7$  of the bed serves to support the slugs in the hopper, and to withdraw the lowest slug therefrom; and the guide grooves  $a^2, a^3$  in this part of the bed serve as means for guiding the slugs from one printing position to the other. This specific construction constitutes a cheap and efficient exemplification of certain necessary parts of the invention, which parts,

however, are obviously capable of wide variation without departure from the generic invention as defined by the appended claims. It is not intended that the broader claims shall be limited even to this particular type of printing machine, namely, the type which employs the reciprocating bed and rotating platen, because, obviously, the invention is capable of adaptation to nearly every type of printing machine. Some parts of the invention, as defined by the claims, are capable of use in machines which do not employ other parts thereof; for example, as stated in the introductory part of the specification, the invention may be employed in a machine which does not print the letter, but prints only the addresses on letters previously written in another machine. The envelop printing part of the invention may, if desired, be omitted, or used with or without the letter printing part of the machine. It is, therefore, not the intention that the appended claims shall be limited to any greater extent than the terms plainly imply.

In using the machine as shown and described, the operator places a sheet of paper on the ribbon T over the type form. The bed then begins its forward movement. An address slug is withdrawn from the hopper and moved forward to the proper position relative to the letter form; and as the paper passes beneath the platen, the letter, its address and signature are printed. The paper is then removed, the bed begins its return movement, and the slug is carried across the bed to the position for printing the envelopes and left there, and then the slug propeller returns to its central position on the bed in readiness to cooperate with the then lowest slug in the hopper. In the next forward movement a new letter is printed and the address is likewise printed on an envelop for the first printed letter. As these operations are repeated, each slug as it moves to the rear of the bed pushes off of the bed the slug which has just served its purpose of printing the envelop. The envelopes and letters being addressed in the same order, it is thereafter necessary to fold the letters in the order in which they are placed, and to put each in the associated envelop.

It is obvious that the practicability of a machine such as is shown, embodying the invention will be increased by providing means for imparting regular short movements of the inking ribbons,—but means for this purpose are common in type writing machines; and since they are not parts of the invention herein claimed, it has not been thought necessary to show any means for this purpose.

Having described my invention, I claim:

1. The combination of a slug holding hopper adapted to discharge slugs through its

lower end, a type-form-carrying member located beneath said hopper and movable backward and forward in a fixed plane across the lower end thereof and having a slug guide which extends in a direction relatively transverse to the direction in which said member moves, means holding the slugs in said hopper until the slug guide on the movable member is beneath the hopper and for then allowing the bottom slug in the hopper to fall therefrom onto said member and into the embrace of said guide, means for moving the slug along said guide to a printing position thereon and for temporarily allowing it to remain stationary in that position and for subsequently moving said slug away from said position and off said member.

2. In a printing machine, the combination of a type-carrying member, its associated platen, an inking ribbon carried by the type-carrying member, and a second inking ribbon which overlies and rests upon a portion of the first mentioned inking ribbon, thereby preventing that portion of the first mentioned inking ribbon which is covered by the second ribbon from making any impression on the surface of the paper on which impressions are to be made,—both of said ribbons being located over that part of the member on which the printing type is to be secured.

3. In a printing machine, the combination of a reciprocating bed adapted to support a type form and having in its surface a transverse guide-way for an address slug, means for periodically introducing address slugs into said guide-way and for moving them along the same into a printing position and then away from said position, an inking ribbon carried by said bed and extending over the type form and over the address slug in the printing position, and a second inking ribbon overlying a part of the first mentioned inking ribbon.

4. In a printing machine, the combination of a reciprocating bed having transverse guide-grooves in its surface and a slot through said bed between said guide-grooves, an address slug having legs entering said guide-grooves and having downwardly projecting lugs which are aligned with said slot, a transversely movable propeller, movable in a guide-way on the said bed, and having two upwardly projecting pins which are adapted to engage with said lugs, one of said pins being vertically movable, means for traversing said propeller back and forth in its guide-way, and means for automatically drawing downward the movable pin of said carrier so as to disengage it from said slug.

5. In a printing machine, the combination of a reciprocating bed having transverse guide-grooves and a slot between said guide grooves, a hopper fixed above said bed,



means on the bed for withdrawing the lowest slug from said hopper, a propeller movable in a guide-way on said bed beneath the slot therein and having pins projecting upward in line with the slot for engagement with the slug supported in said guide-ways, a feed screw engaging the said propeller, and means by which said feed screw is turned in the proper direction and for the proper time to move said propeller first from the middle of said bed a distance in one direction, and then across the bed, and back again to the central position while the bed is making one complete reciprocatory movement.

6. In a printing machine, the combination of a movable type supporting member having a slug guide-way extending transversely upon the same and having a slot parallel with said guide-way and having below said slot a guide-way for a slug propeller, a slug propeller movable in said guide-way having two upwardly projecting pins of which one pin is vertically movable and has a head upon its lower end, means for moving said propeller back and forth in its guide-way and a cam rib on said member engaging with said head for drawing said movable pin downward.

7. In a printing machine, the combination

of a movable member having on its top a transverse slug guide-way and having a slot parallel with said guide-way, and having also a propeller guide-way, a propeller movable in the last mentioned guide-way and having upwardly extended pins adapted to enter said slot and engaging with a slug in the slug guide-way, said propeller having a downwardly projecting threaded boss, a feed screw mounted on said movable member engaging said boss, a pinion fast to the end of said feed screw, an arm hung loosely on the feed screw shaft adjacent to said pinion, a pinion mounted on said arm meshing with the pinion on the feed screw shaft, a fixed rack and adjacent thereto a rail terminating at its ends in vertical shoulders leading to a rail portion in a lower level, an arm pivoted to the arm previously mentioned having in its lower end a friction roller adapted to ride on said rail, and means limiting the movement of said arm about its pivot.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

EDWARD G. ERNST.

Witnesses:

E. B. GILCHRIST,  
E. L. THURSTON.