

(No Model.)

5 Sheets—Sheet 1.

W. B. WAIT. WRITING MACHINE.

No. 521,397.

Patented June 12, 1894.

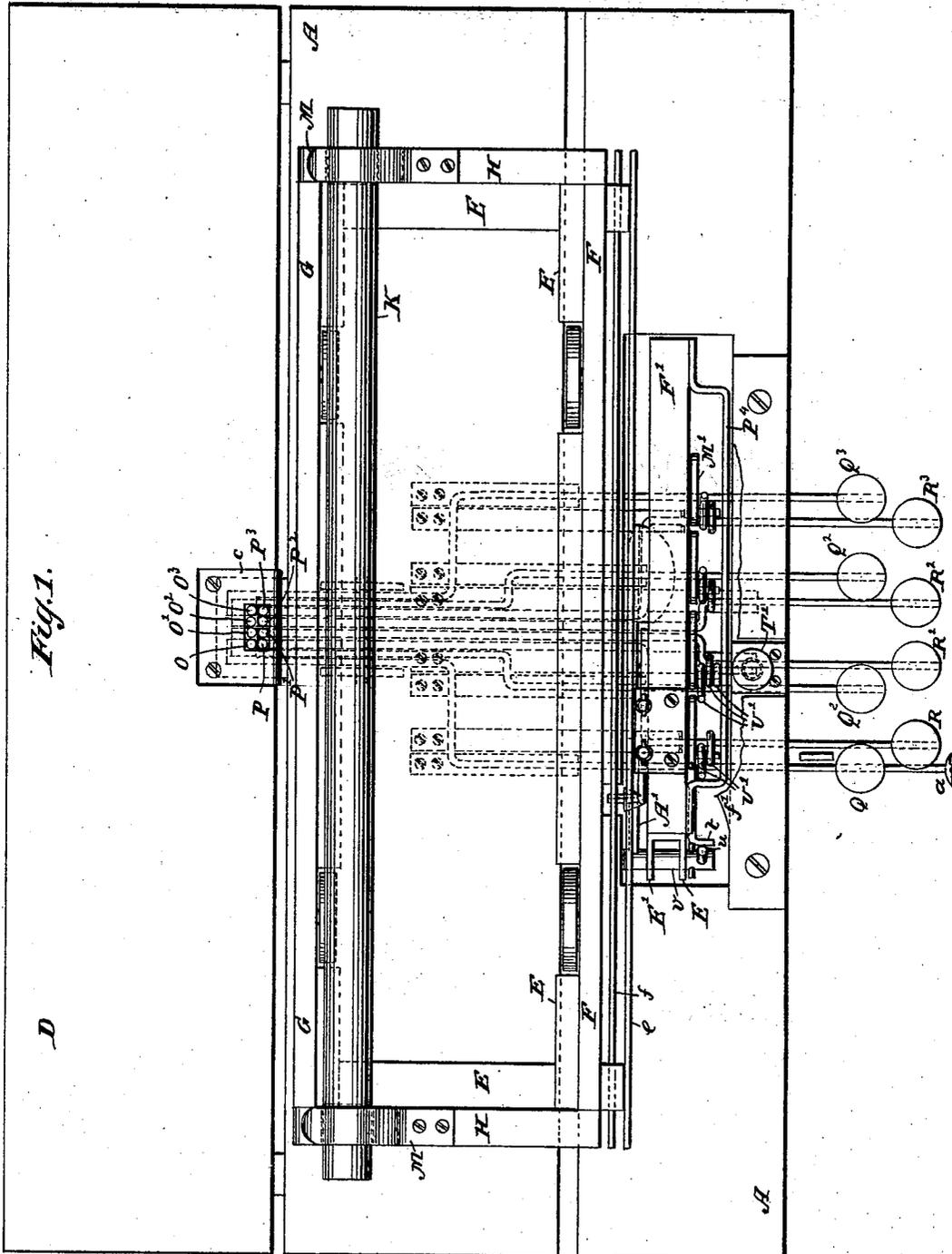


Fig. 1.

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ATTORNEYS.

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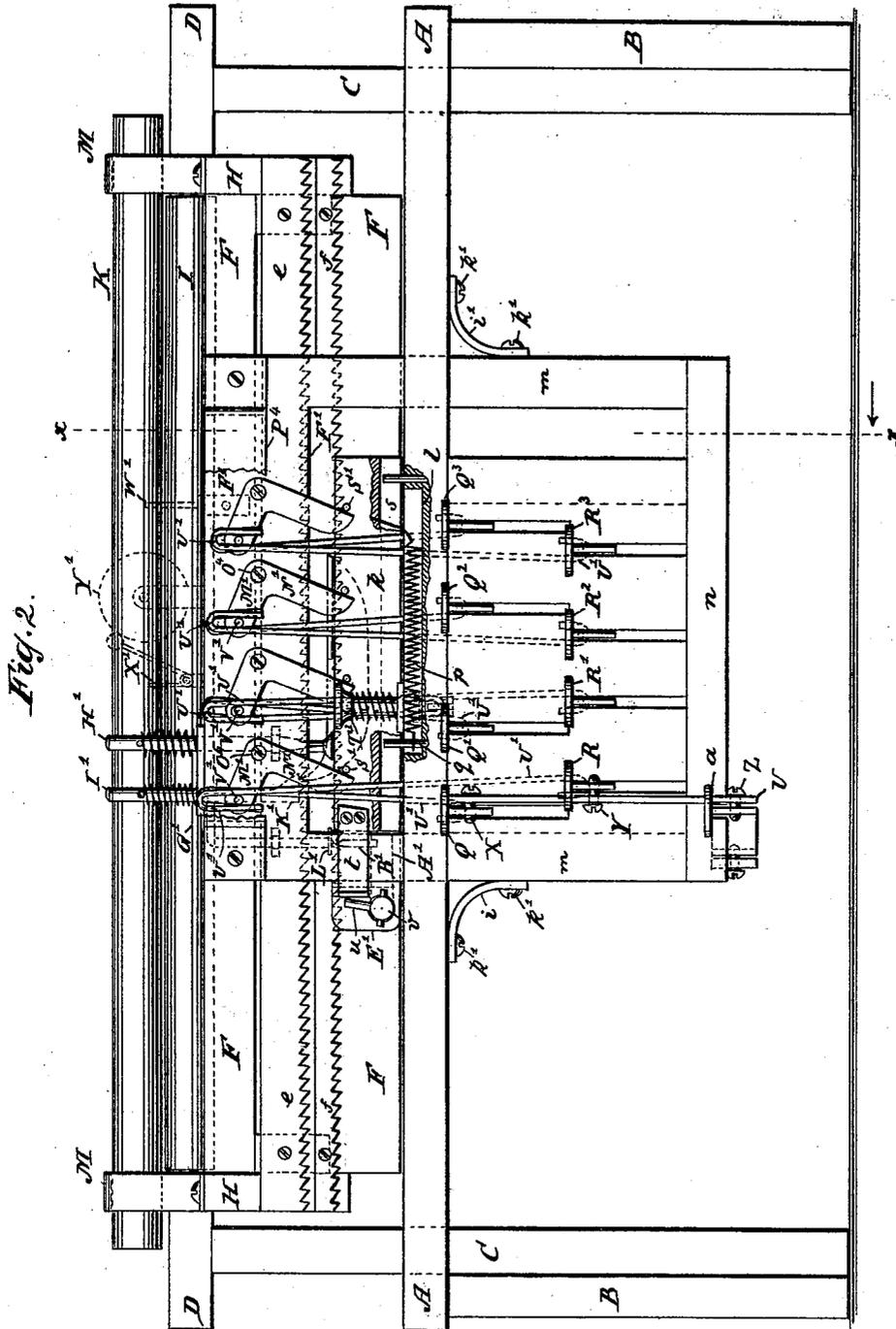


Fig. 2.

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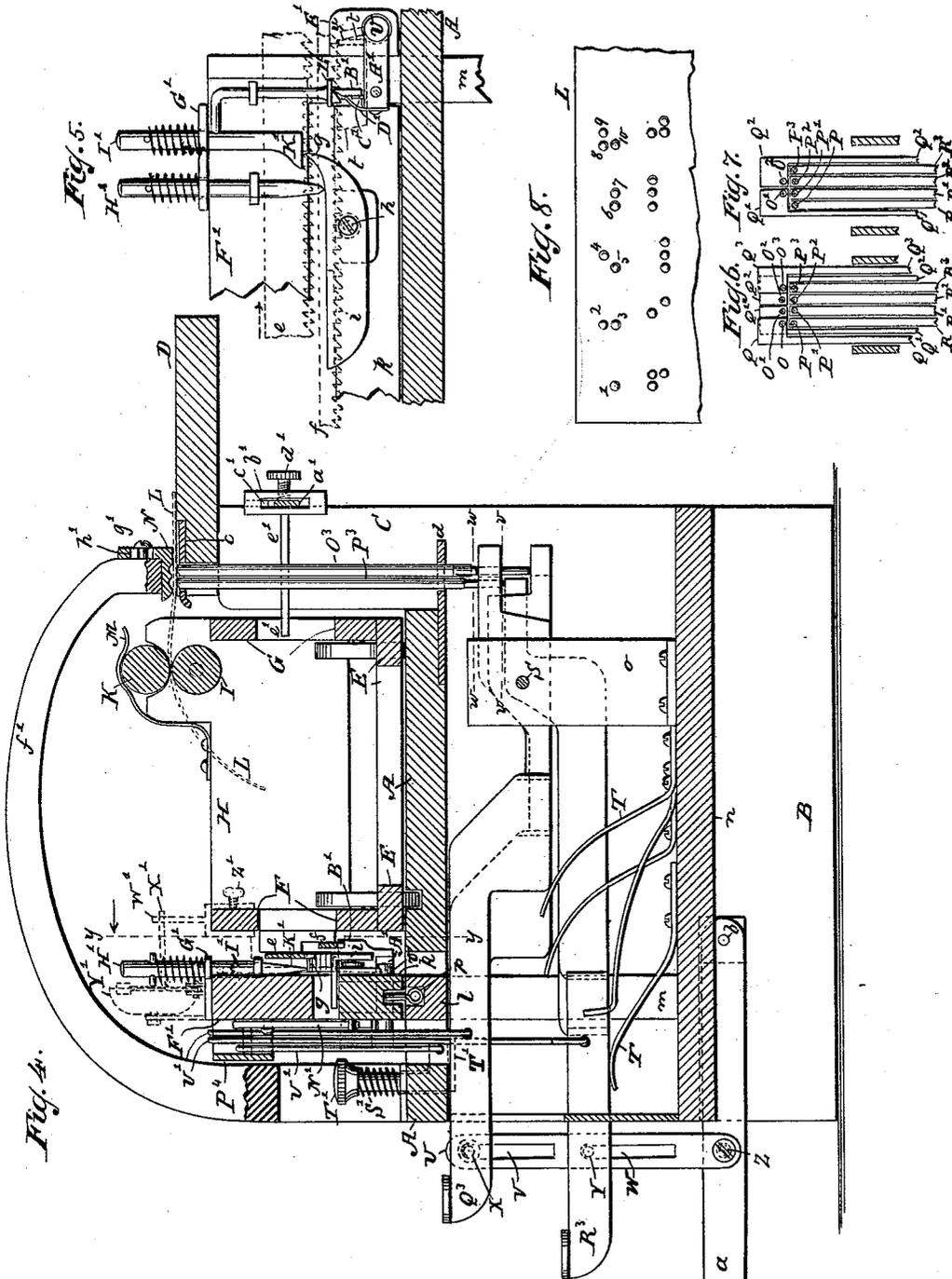
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Fig. 10.

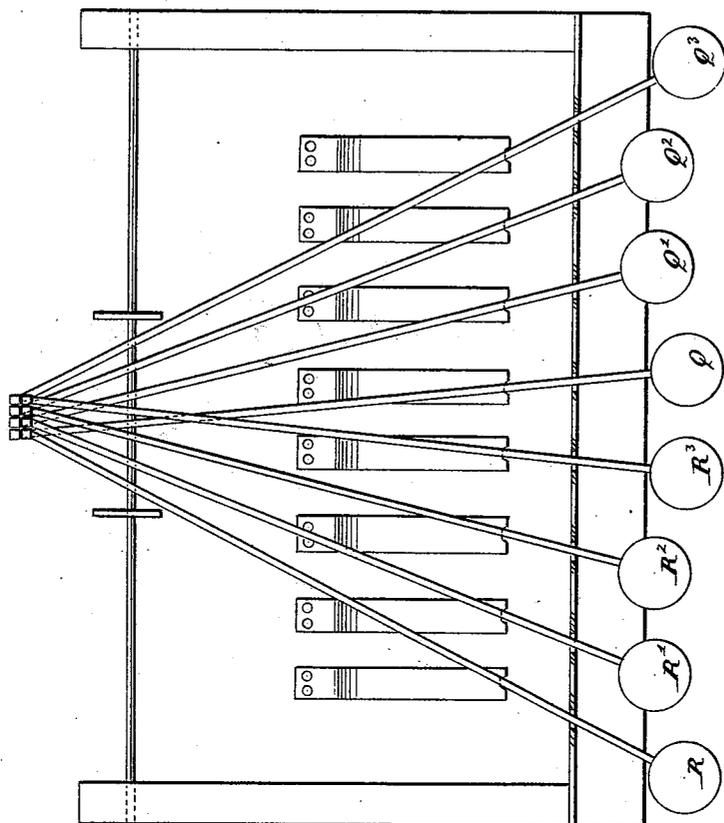
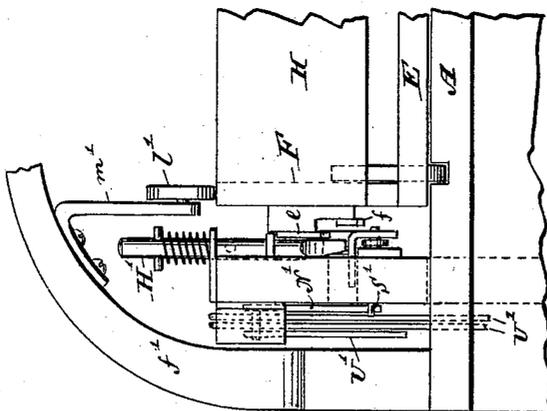


Fig. 9.



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WILLIAM B. WAIT, OF NEW YORK, N. Y.

WRITING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 521,397, dated June 12, 1894.

Application filed May 25, 1893. Serial No. 475,486. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. WAIT, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Writing-Machines, of which the following is a specification.

The object of this invention is to provide a machine serviceable for embossed writing or point writing such as used for blind persons who read by touch and the invention consists in the novel features of construction set forth in the following specification and claims and illustrated in the annexed drawings, in which—

Figure 1 shows a plan view of the machine. Fig. 2 shows a front elevation of the machine. Fig. 3 shows a rear elevation of the machine. Fig. 4 is a section along xx Fig. 2. Fig. 5 is a section along yy Fig. 4. Fig. 6 is a section along ww Fig. 4. Fig. 7 is a section along vv Fig. 4. Fig. 8 shows a sheet with embossed writing. Fig. 9 shows a detail view of part of the paper carriage with adjacent parts. Fig. 10 shows a modified arrangement of keys.

In the drawings the letter A indicates a table having legs or supports B. On the supports or risers C is supported another table D. On the table A is a paper carriage consisting of a bottom part or frame E, a front frame F, a rear frame G and side pieces H. A roller I is journaled in the carriage and between this roller and a roller K passes the sheet or paper L. The paper may be either a sheet of limited size or the carriage may be provided with a roll from which paper may be continuously fed between rollers I K. The roller K is pressed by springs M so that it can yield according to varying thicknesses of paper passed between rollers I K and by lifting springs M high enough the roller K can be taken out of its seat in the carriage sides H.

The paper or sheet L passes between a die or face N and styluses or printing bars of which eight are shown in the drawings lettered $O O' O^2 O^3 P P' P^2 P^3$. The number of printing bars can manifestly be varied. The styluses are actuated by keys or levers, the lever Q actuating stylus O, and the levers $Q' Q^2 Q^3$ respectively actuating styluses or print-

ing bars $O' O^2 O^3$ while the keys $R R' R^2 R^3$ respectively actuate styluses $P P' P^2 P^3$. The styluses are shown in two rows, the styluses $O O' O^2 O^3$ being at the rear. By arranging the front ends of the keys in correlation to the styluses so that for example the front ends of keys Q to Q^3 lie farther back or do not project so far forward as the front ends of keys R to R^3 actuating the styluses P to P^3 of the front row, a blind person feeling the front ends of the keys can determine whether a key is being actuated which operates a stylus in the front or rear row.

The actuating keys or levers Q to Q^3 and R to R^3 are shown as levers of the first class and swing or move on the fulcrum or bar S. When the front end of a key is depressed the rear end on which rests the stylus moves up carrying the stylus toward the die N so as to dent or emboss the sheet L. When the key is released its restoring spring T (Fig. 4) brings the key back to the starting point.

It is evident that by actuating one or more of the styluses the sheet L can be provided with corresponding dents or bosses the varied number and location of which can convey meaning according to any adopted point writing system. In Fig. 8 for example the boss 1 can be produced by actuating stylus P, bosses 2 and 3 by styluses O P, bosses 4 and 5 by styluses $O' P$, bosses 6 and 7 by styluses $P P'$, bosses 8, 9 and 10 by styluses $O O' P$, and so on, it being evident that a simultaneous depression of several keys will cause a corresponding simultaneous actuation of the corresponding styluses.

In order to facilitate the simultaneous actuation of several keys I may employ one or more key uniting yokes. A yoke U is shown in Figs. 2 and 4 at the keys Q R. The yoke has slots V W into which extend the pins or lugs X Y extending respectively from keys Q R. If key Q alone is depressed or actuated its stud X will play in slot V without affecting yoke U or key R, while if key R alone is depressed its stud Y will play in slot W without affecting yoke U or key Q. Should it be desired to actuate keys Q R simultaneously it is not necessary to press the fingers on said keys since by drawing down the yoke U the latter will draw down both keys Q R. The yoke is shown jointed or connected at Z to a

key or lever *a* fulcrumed at *b* and as one finger serves to actuate key *a* and thereby move keys Q R the operation is simplified. I have shown but one yoke connecting keys Q R but it is apparent that yokes can be applied to the other levers as found advantageous.

The styluses are set or guided in a plate *c* conveniently secured to table D and in a plate *d* conveniently secured to table A. The hole in each of plates *c d* is large enough to accommodate all the styluses which latter rest one alongside the other. The holes in plates *c d* may be considered as forming a common cell or housing for all the styluses and as said styluses rest in contact with one another the upward motion of one stylus will tend to raise the adjoining ones by the frictional contact so that the work of raising several styluses at once is eased and when one stylus drops it tends to carry down others. By diminishing the diameter of the lower parts of the styluses which parts rest on the actuating keys or levers, any slight lateral play or displacement of a lever will not cause said lever to engage another than its own stylus, since the spaces between the thinned or diminished lower end portions of the styluses will allow the actuating key on which one lower end portion rests some lateral displacement before such key will engage another lower end portion of a stylus.

The paper carriage E F G H runs on a suitable track or way on table A and is provided with a feed rack *e* and with a stop rack *f*. By forming these racks separately and attaching them separately to the carriage, each rack can be properly adjusted without regard to the other, and in case one rack is defective or out of order, it can be replaced without disturbing the other rack. The feed rack *e* is adapted for engagement by dog *g* (Fig. 5) swinging on support *h* and having the tail *i* overweighted so that the dog *g* is pressed toward the rack *e*. The support or pivot *h* extends from a feed block *k*. The feed block *k* might be supported on table A but I prefer to cut away the table at the part under block *k* and to place into this cut out portion a cross piece or brace *l* (Fig. 4) secured to the hangers *m* having at their lower part a table or platform *n*, which latter supports the key restoring springs T and also arms or supports *o* through which extends the key fulcrum S. The feed block *k* is reciprocated or slid back and forth to give a step by step or feed motion to rack *e* and to the paper carriage. The feed block *k* is pulled by the tension of spring *p* (Fig. 2) secured at one end to a fixed point or stud *q* rising from brace *l*, the other end *s* of the spring being driven into or suitably secured to the feed block *k*. When the feed block is forced back against the tension of spring *p* the pawl *g* rides or clicks over rack *e* without moving the latter, but when the block *k* is released to be drawn or moved by the spring *p* the pawl *g* engages rack *e* so as to lock the paper

carriage and feed block together and cause both to be moved by the tension of spring *p*.

From the feed block *k* extends an arm *t* into contact with a nose *u* on rock shaft *v* to which is fixed an arm A' (Fig. 5) carrying a stop pawl B'. The stop pawl B' is jointed at C' to the arm A' by a knuckle joint which will enable the pawl to yield in the direction opposed to the feed of the carriage but when the pawl B' is held up to the upright position shown in Fig. 5 by the spring D' pressing on said pawl the latter cannot yield in the direction of the feed of the carriage. The rock shaft *v* is mounted in a support or arms E' extending from one of the hangers *m* which latter are made to extend up through the cut or opening in table A and are provided at their upper ends with a cross piece or brace F'.

When the feed block *k* is moved toward rock shaft *v* by the action of spring *p* the arm *t* coming against nose *n* will swing the rock shaft *v* to carry arm A' and pawl B' toward the stop rack *f*. When the block *k* recedes to bring its pawl into engagement with another tooth of feed rack *e* the arm *t* moving away from nose *n* will release the latter so that the rock shaft *v* is free to swing under the weight of the arm A' which latter now drops to free the pawl B' from the stop rack *f*. When the feed block *k* now makes its feed stroke under the tension of spring *p* the carriage is free to move or be fed as the stop pawl B' is out of engagement with stop rack *f*. As the block *k* moves in its feed stroke to carry the arm *t* toward nose *n* the rock shaft *v* is swung to carry the arm A' and pawl B' toward stop rack *f* so that when the feed block *k* has finished its feed stroke the pawl B' has engaged stop rack *f* and prevents the paper carriage from being carried by its momentum beyond the proper point, so that no inaccurate work or spacing will result.

The feed dog *g* can be depressed or moved out of engagement by a spring raised releasing key or plunger H' (Fig. 5) guided in a suitably perforated plate G' secured to the cross piece F'. By depressing the key H' the feed dog or pawl *g* is moved out of engagement with feed rack *e* and the paper carriage can then be set back since the stop pawl B' as already noticed can yield in a backward direction so as to click or pass over the stop rack *f* when the carriage is set back. The spring raised releasing key or plunger I' has an arm K' for the feed pawl *g* and an arm L' for the stop pawl B' so that by depressing key I' both the feed and the stop pawls can be moved out of engagement.

The feed block *k* is actuated by the keys Q to Q³ and R to R³. On the cross piece F' are fulcrumed the levers M' N' at O'. A guard or plate P⁴ (Fig. 1) is shown extending along the outer faces of the levers. The lever arms N' rest against studs S' on the feed block *k*. The lever arms M' have studs V' (Fig. 2) over which are hooked or looped the links U' con-

necting with the keys. When a key is depressed the corresponding link U' is actuated to swing the corresponding lever $M' N'$ so that its arm N' presses or moves block k against the tension of spring p or in other words to give to feed block a back stroke. On the release of the key the latter rises with its link U' so as to free the lever $M' N'$ and to allow the spring p to give the block k a feed stroke.

In case of point writing when for example the depression of key Q is intended to produce one point or boss and the depression of several keys as for example $Q Q'$ several adjacent points or bosses lying in line alongside one another, the throw of the feed block in the case of several such bosses should be somewhat greater than in case there is but one boss, so that uniformity in spacing the writing is attained. By making the links U' from the keys $Q R$ loop over the corresponding lever stud V' at a certain elevation or distance above said stud V' when the keys $Q R$ are raised said keys or either of them when depressed will move down the corresponding link U' some distance before the link will act to begin the movement of stud V' and lever $M' N'$ so that the latter will not be moved until the key Q or R has neared the end of its down stroke and the lever $M' N'$ with feed block k are thus moved but a slight distance, say the space of one tooth of feed rack e . By making the links U' from keys $Q' R'$ to loop over the stud V' of the corresponding lever $M' N'$ at a less height above said stud V' than in the case of the links from keys $Q R$, said links from keys $Q' R'$ will begin to actuate the corresponding lever $M' N'$ at an earlier point in the downstroke of said keys $Q' R'$ than in the case of keys $Q R$ so that the feed block on the actuation of keys $Q' R'$ will make a stroke corresponding to say two teeth of the feed rack e . The links U' from keys $Q^2 R^2$ and $Q^3 R^3$ can respectively be made to actuate the corresponding levers $M' N'$ at still earlier periods in the respective actuation of said keys so that the stroke of the feed block k is still further increased, resulting in a correspondingly increased feed of the paper carriage. By thus causing the keys to variably actuate the feed block k uniformity in spacing can be preserved as well when numerous points or bosses are grouped together as when the points or bosses are isolated or grouped in lesser number.

A spring raised spacer key T' (Figs. 1, 2 and 4) is connected by a link U' with one of the levers $M' N'$ so that by depressing or actuating said key T' the feed block k is actuated to feed the carriage while the keys remain at rest.

A finger W' (Figs. 2 and 4) can be adjustably secured to the paper carriage so as to actuate a bell hammer X' applied in any suitable way to strike the alarm Y' when the edge of the paper or sheet carried by the carriage is being approached. The finger W' is of course to be adjusted according to varying

widths of the paper or sheet employed in the machine. The motion of the carriage can also be limited to correspond to the width of the sheet which may be used at the time. By securing a rack a' (Figs. 3 and 4) at the rear of the machine and placing on said rack rings or saddles b' provided each with a tooth c' for engaging between the rack teeth and with a set or clamp screw d' and with a finger e' , which fingers e' project into the carriage frame G , the play of the carriage can be limited or regulated by setting the fingers more or less apart, as the contact of the ends of frame G with either finger e' will arrest the movement of the carriage in one direction or another.

The die or face N is shown secured to or carried by an arm or goose neck f' rising from table A and by adjustably securing the die N to goose neck f' as by screw and slot connection $g' h'$ the die N can be properly set.

The printing bars O to O^3 and P to P^3 are shown with their printing ends rounded or convexed so as to make dents or bosses in the sheet, but of course the ends of the bars could also be provided with type, or with various characters, numbers or marks which on the actuation of the printing bars would be reproduced on the sheet.

The hangers m (Fig. 2) carrying the platform n can be secured to table A by suitable fastenings such as angle irons i' held by screws k' on loosening which the hangers m and platform n with the mechanism supported thereon can be dropped or removed from table A , the brace I can thus be removed when required, and may be considered as a detachable part of the table A .

In order to keep the carriage $E F G H$ down on the table A so that the carriage will not jump or run off its track or improperly lift its racks $e f$ out of gear with the feed and stop pawls a roller l' (Fig. 9) journaled on an arm m' extending from goose neck f' may be provided which roller being placed above the carriage will not allow the latter to jump or rise while at the same time the carriage is free to feed.

The keys Q to Q^3 and R to R^3 instead of being arranged as in Figs. 1 and 2 may be arranged as in Fig. 10 where the keys are shown spread out.

The rollers $I K$ it may be noted can be rotated by hand to feed the sheet or paper L or said rollers can be provided with any suitable rotating mechanism customary in writing machines.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a stylus, or printing bar, and an actuating key or lever, of a paper carriage, a table on which the carriage travels and which table has a recess or cut out portion, a feed block for the carriage actuated by the key, hangers depending from the table, a cross piece or brace supported by the hangers in the cut out portion of the table and supporting the feed block, a platform se-

cured to the lower part of the hangers, and a key restoring spring and key fulcrum supported on said platform, substantially as described.

5 2. The combination with a stylus, or printing bar, and an actuating key or lever, of a paper carriage, a table having a recess or cut out portion and on which table the carriage travels, a feed-block for the carriage actuated
10 by the key, and a cross piece or brace inserted into the cut out portion of the table and made to support the feed-block, substantially as described.

15 3. The combination with a series of styluses or printing bars and actuating keys or levers, of a paper carriage a table on which the carriage travels and a feed block for the carriage, said feed block being made to reciprocate on the table, bell crank levers for actuating the block and links for conveying motion from the keys to the levers, said links being connected to the levers by varying pin and slot connections so that the levers are variably actuated substantially as described.

20 4. The combination with a stylus or printing bar and an actuating key or lever, of a paper carriage, a table on which the carriage travels a feed block for the carriage, an actuating lever as M' N' for the block and a link made to extend from the key to the block actuating lever said block being made to reciprocate on the table substantially as described.

35 5. The combination with a stylus, or printing-bar, and an actuating key or lever, of a paper carriage provided with a feed rack, a table having a recess or cut out portion and on which table the carriage travels, a feed-block provided with a pawl for engaging the rack and a cross piece or brace inserted into the cut out portion of the table, said feed-block being actuated by the key and being guided to reciprocate or slide on the cross piece, substantially as described.

45 6. The combination with a stylus or printing bar and an actuating key or lever, of a table a paper carriage made to travel on the table and provided with a feed rack and a feed block made to slide on the table and actuated by the key, said feed block being provided with an overweighted pawl adapted to ride over the rack during the back stroke of the block and to engage the rack during the feed stroke of the block substantially as described.

50 7. The combination with a stylus, or printing bar, and a paper carriage provided with a feed-rack, of a table having a recess or cut out portion and on which table the carriage travels, a cross-piece or brace secured in said recess, a feed-block made to slide on the cross piece and adapted to engage the rack, a spring for giving a feed stroke to the block, and a key or lever for actuating the stylus and for giving a back stroke to the block, substantially as described.

55 8. The combination with a series of styluses

or printing bars and actuating keys or levers, of a paper carriage, a feed block for the carriage, a series of actuating levers as M' N' for the feed block and links made to extend from the keys into variable engagement with the block actuating levers substantially as described.

75 9. The combination with a stylus or printing bar and an actuating key or lever, of a paper carriage provided with a feed rack and a stop rack, a table on which the carriage travels, a feed block actuated from said key or lever and made to slide along the table, a feed pawl carried by said block to engage the feed rack, and a stop pawl movable independently of the feed pawl and actuated by the feed block to engage the stop rack of the carriage, said stop pawl being pivoted clear of the feed block by which it is held in engagement with the stop rack and being adapted to move out of engagement when freed by the feed block, substantially as described.

80 10. The combination with a stylus or printing bar and an actuating key or lever, of a paper carriage, a feed block provided with a feed pawl for the carriage, a table on which the carriage and feed block are reciprocated, and a stop pawl for the carriage, said stop pawl being pivoted clear of the feed block and actuated therefrom to engage the stop rack and being so overbalanced as to drop out of engagement on the back stroke of the feed block, substantially as described.

85 11. The combination with a stylus or printing bar and an actuating key or lever, of a paper carriage provided with separately attached racks, a feed block provided with a feed pawl to engage the feed rack of the carriage, a table along which said carriage and feed block are made to reciprocate, and a stop pawl pivoted clear of the feed block and actuated therefrom to engage the stop rack of the carriage, said stop pawl being made rigid or unyielding in the direction of the feed of the carriage and yielding or movable in the direction opposed to the feed of the carriage, substantially as described.

90 12. The combination with a stylus or printing bar and an actuating key or lever, of a paper carriage provided with independently attached feed and stop racks, a feed block provided with a feed pawl to engage the feed rack, a table on which the carriage and feed block are made to reciprocate, a stop pawl pivoted clear of the feed block and actuated therefrom to engage the stop rack, said stop pawl being rearwardly yielding to allow the carriage to be set back, and a movable releasing key adapted to act on the feed pawl while leaving the stop pawl in engagement, substantially as described.

95 13. A pair of styluses or printing bars, and an actuating key for each bar, combined with a yoke having slotted portions and suspended at said slotted portions from the actuating keys so as to allow each of said keys to be independently depressed, and a third key to

which said yoke is firmly pivoted so that the depression of said third key will actuate the yoke to produce a simultaneous action of the actuating keys, substantially as described.

5 14. The combination with a stylus or printing bar and a die or face against which said bar acts of an arm or goose neck *f'* for supporting the die, a table or support A for the arm, a carriage made to travel on the table

and a roller *l'* for holding the carriage to the table substantially as described. 10

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

WM. B. WAIT.

Witnesses:

WILLIAM C. HAUFF,
E. F. KASTENHUBER.