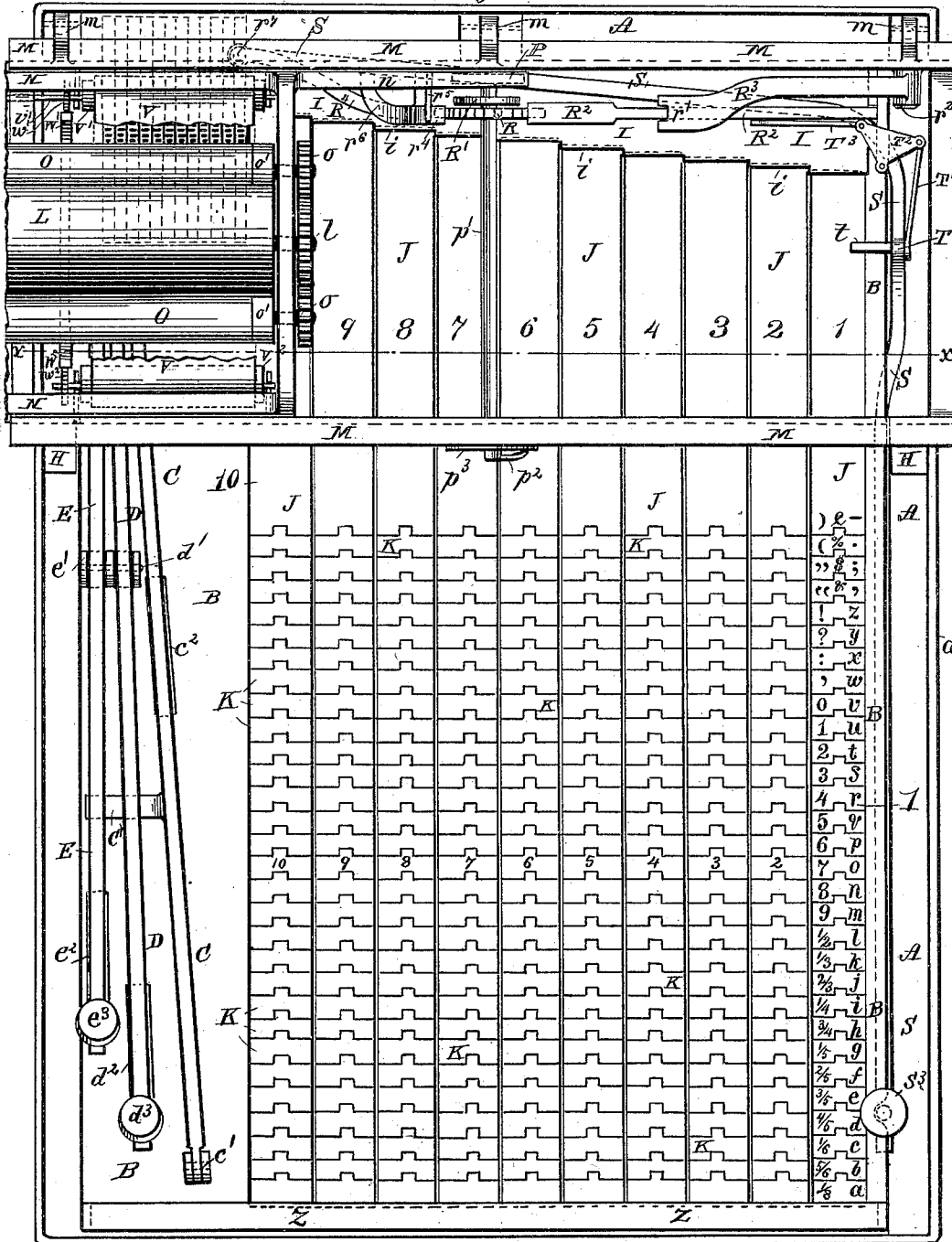


L. G. GARRETT.
TYPE WRITING MACHINE.

No. 401,780.

Patented Apr. 23, 1889.

Fig. 1.

Witnesses:
J. D. Garfield.
C. Sedgwick.

Inventor:
L. G. Garrett
By Munn & Co
Attorneys.

L. G. GARRETT.
TYPE WRITING MACHINE.

No. 401,780.

Patented Apr. 23, 1889.

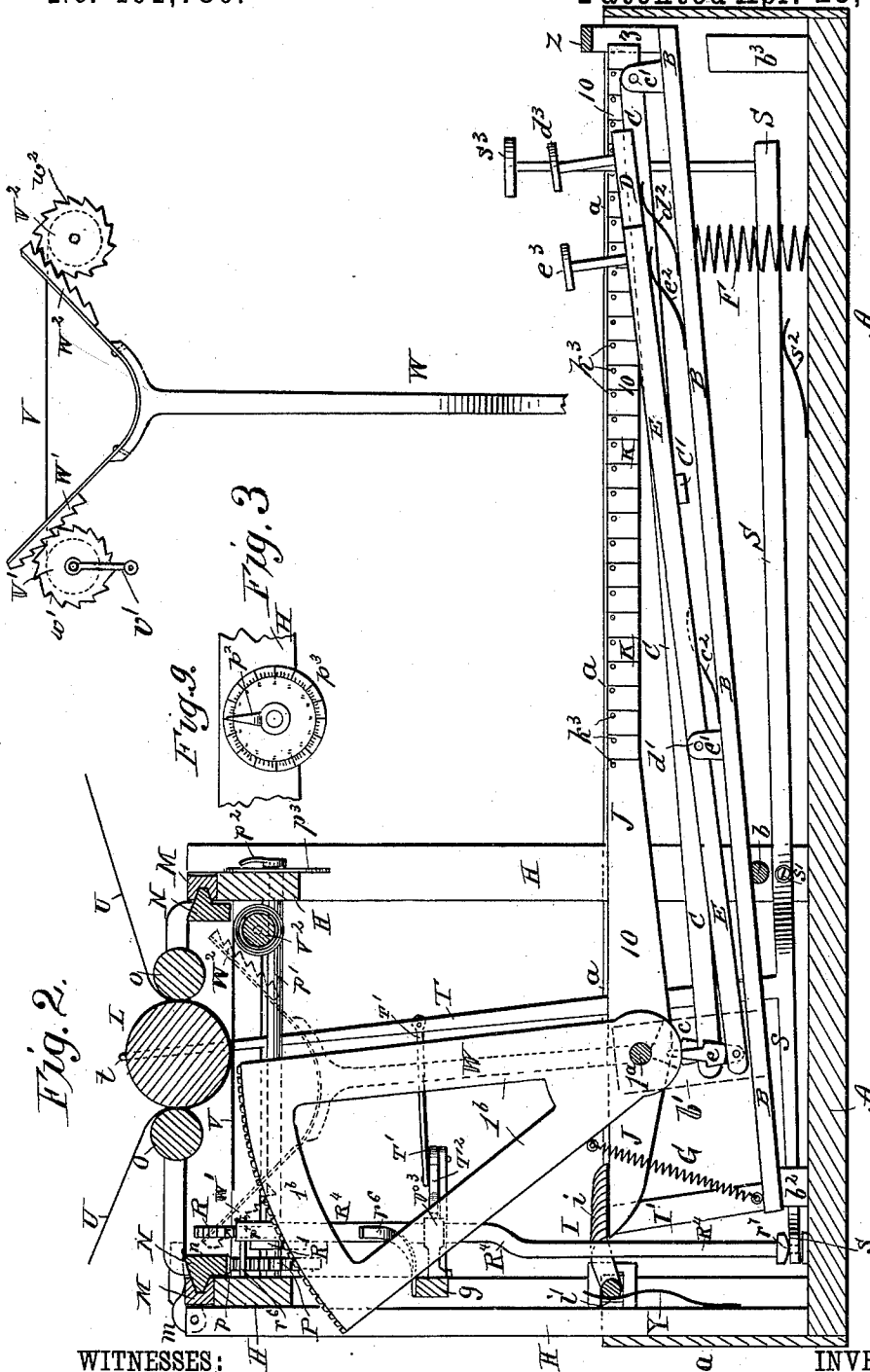


Fig. 2.

Fig. 3.

Fig. 4.

WITNESSES:
J. D. Garfield
C. Sedgwick

INVENTOR:
L. G. Garrett
BY *Munn & Co*
ATTORNEYS.

L. G. GARRETT.
TYPE WRITING MACHINE.

No. 401,780.

Patented Apr. 23, 1889.

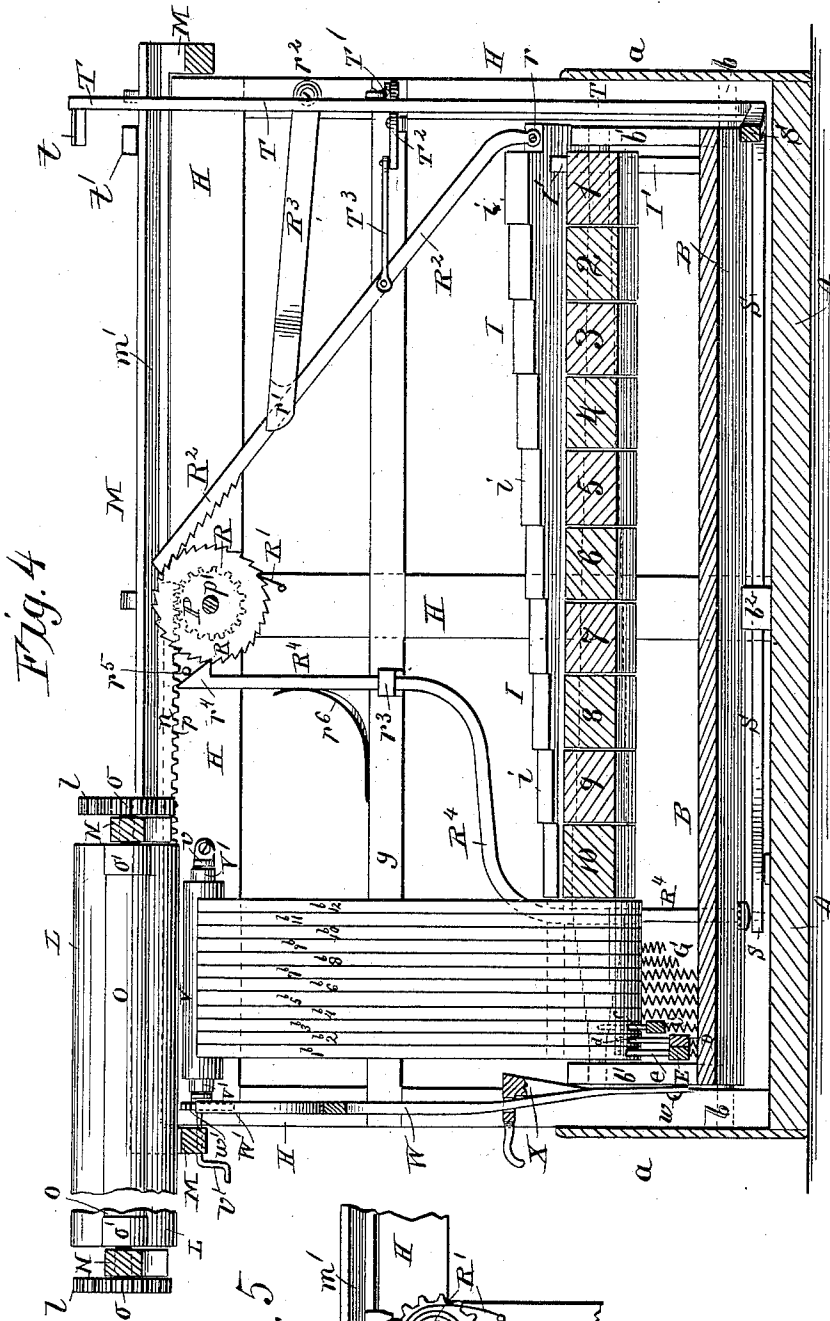
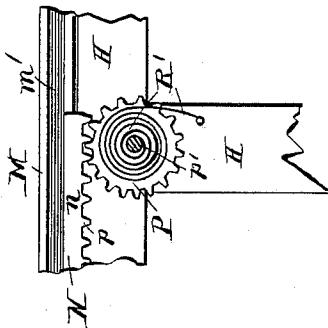


Fig. 4

Fig. 5



WITNESSES:

J. D. Garfield
C. Sedgwick

INVENTOR:

L. G. Garrett

BY

Munn & Co.

ATTORNEYS.

L. G. GARRETT.
TYPE WRITING MACHINE.

No. 401,780.

Patented Apr. 23, 1889.

Fig. 6.

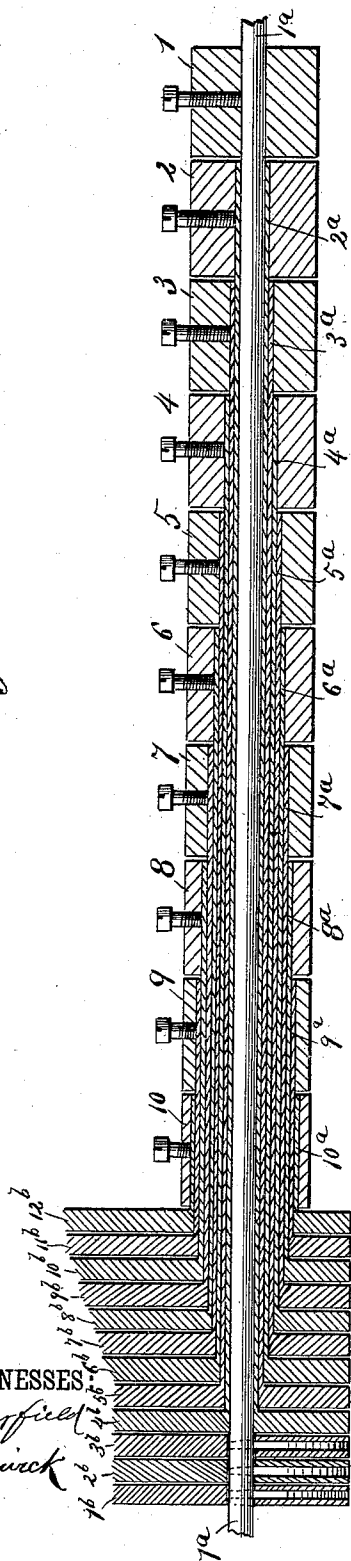


Fig. 8.

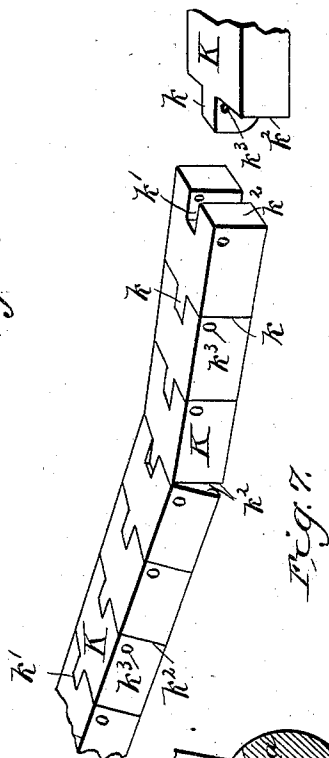
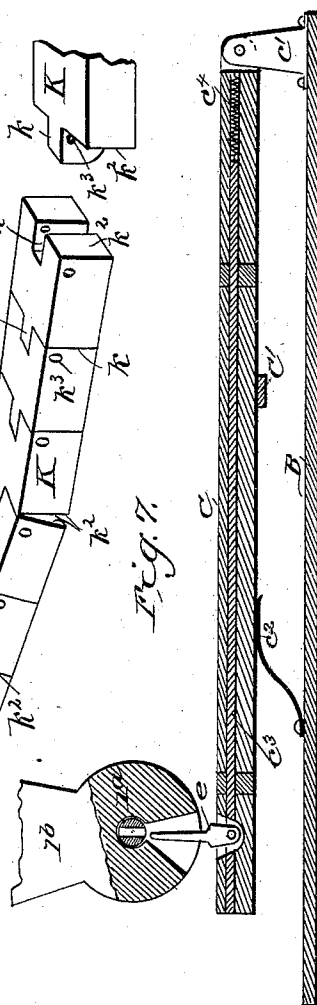


Fig. 7.



WITNESSES

J. D. Garfield
C. Sedgwick

INVENTOR:

L. G. Garrett

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

LEBBEUS G. GARRETT, OF BISSELL, PENNSYLVANIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 401,780, dated April 23, 1889.

Application filed May 31, 1887. Serial No. 239,913. (No model.)

To all whom it may concern:

Be it known that I, LEBBEUS G. GARRETT, of Bissell, in the county of Washington and State of Pennsylvania, have invented a new and Improved Type - Writing Machine, of which the following is a full, clear, and exact description.

My invention relates to a machine of that class known as "type-writers," and has for its object to provide a simple and efficient machine of this character by which whole words or phrases may be printed at once on the same line across a page and at a reporting speed by depressing keys of a key-board conveniently arranged at the front of the instrument.

The invention consists in certain novel features of construction and combination of parts of the type-writer, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters and figures of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of my improved type-writer with the paper-holding carriage broken away. Fig. 2 is a longitudinal vertical sectional elevation of the machine. Fig. 3 is a detail view illustrating parts of the mechanism by which the inking-ribbon is shifted. Fig. 4 is a vertical transverse section taken on the line *x x*, Fig. 1. Fig. 5 is a detail rear view of the carriage-retracting mechanism. Fig. 6 is an enlarged transverse vertical section taken through the type-sector carrying-shafts and the lower parts of the sectors. Fig. 7 is an enlarged detail side view, partly in section, of the lower part of either of the three left-hand sectors and its coupling device. Fig. 8 is a perspective view of part of one of the sectional keys of the instrument; and Fig. 9 is a detail view of the front bar of the frame, showing the graduated dial and pointer.

The type-writer will have a suitable case, the lower or base portion only of which is shown in the drawings, and consists of a bed-plate, A, on which the operating mechanism of the instrument is supported, and a low side casing or plate, *a*, which extends upward

from the bed-plate about as high as the top of the key-board. The upper part of the case may have any approved construction forming a suitable cover, which may be removed when the machine is to be used.

The key-board of the instrument consists of a series of keys, preferably ten, which are indicated in the drawings by the numerals 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10, respectively, and are numbered successively from the right toward the left of the key-board, as shown in Figs. 1, 4, and 6. The first key, 1, is fixed to a shaft, 1^a, which is journaled transversely of the instrument in lugs or short posts *b' b'*, which are fixed to opposite edges of a rocking plate, B, which is fixed to a shaft, *b*, journaled in the frame of the machine. This plate B extends rearward beneath the key-board, and preferably at a rising inclination from its rear to its front end, and the keys 1 to 10 are adapted to be depressed to the plate to cause the reciprocating type-carrying sectors which are supported by the shaft 1^a to be tilted or rocked to bring the various types on the sectors into line for print, as hereinafter fully explained.

In the machine shown there are twelve type-sectors, which are placed face to face and carry type upon their upper edges, which are curved in the arc of a circle struck from the shaft 1^a as a center. The type-sectors are marked 1^b to 12^b, inclusive, and in order from left to right. The extreme left-hand sector, 1^b, and the two next sectors, 2^b and 3^b, are fitted loosely upon the shaft 1^a, to which the key 1 is fixed. The next sector to the right hand, or 4^b, is fixed to a tubular shaft or sleeve, 2^a, which is fitted loosely on the common shaft 1^a, and to which sleeve the second key, 2, is fixed. The next sector to the right hand, or 5^b, is fixed to a tubular shaft or sleeve, 3^a, which fits loosely upon the sleeve 2^a, and to which the key 3 is fixed. The next sector, 6^b, is fixed to a sleeve, 4^a, which fits loosely upon the one 3^a, and to which the key 4 is fixed. The next sector, 7^b, is fixed to a sleeve, 5^a, which fits loosely upon 4^a, and to which the key 5 is fixed. The next sector, 8^b, is fixed to a sleeve, 6^a, which fits loosely upon 5^a, and to which the key 6 is fixed. The next sector, 9^b, is fixed to a sleeve, 7^a, which fits

loosely upon 6^a, and to which the key 7 is fixed. The next sector, 10^b, is fixed to a sleeve, 8^a, which fits loosely upon 7^a, and to which the key 8 is fixed. The next sector, 11^b, is fixed to a sleeve, 9^a, which fits loosely upon 8^a, and to which the key 9 is fixed, and the next or extreme right-hand sector, 12^b, is fixed to a sleeve, 10^a, which fits loosely upon 9^a, and to which the extreme left-hand or last key, 10, of the key-board is fixed. I prefer to secure the keys to their respective shafts or sleeves by set-screws, all as most clearly shown in Fig. 6 of the drawings.

With this construction it is obvious that either of the type-sectors 1^b 2^b 3^b may be rocked by depressing the first key, 1, when any one of the sectors is connected with or coupled to the common shaft 1^a, and I will now describe the means employed to effect their coupling, as follows: A lever, C, which is fulcrumed at *c'* to the front end and left-hand side of the plate B, is provided with a laterally-projecting lug, *C'*, on which the other two coupling-keys, D E, rest. A spring, *c*², between the plate B and the lever C normally forces a coupling-pin, *c*, which is pivoted to the inner end of a sliding bar, *c*³, normally held in position by a spring, *c*⁴, and working in grooved way in the lever C up through a recess in the lower end of the third sector, 3^b, into a hole in the sector-shaft 1^a, and whereby this type-sector 3^b will be normally coupled to the shaft 1^a to be operated by the key 1 of the instrument. The keys D E are fulcrumed on a pin, *d'*, passed through a suitable bearing-block, *e'*, fixed to the rocking plate B, and the inner ends of said keys D E are provided, respectively, with pivoted coupling-pins *d e* in sliding bars, like the one *c* of the lever C, but entering recesses in the lower ends of the type-sectors 2^b and 1^b, respectively, and each adapted to enter a hole provided for it in the shaft 1^a of the first key, 1. Springs *d*² *e*² between the keys D E and the plate B in front of the key-fulcrums normally hold the coupling-pins *d e* of these keys out of their holes in the shaft 1^a. In other words, when the finger-plates *d*³ *e*³ at the outer or front ends of the keys D E are not depressed, the coupling-pin *c* of lever C will be engaged with the sector 3^b and the shaft 1^a, and the pins *d e* of the keys D E, while resting in the recesses of their sectors 2^b and 1^b, respectively, will be disengaged from the shaft 1^a and cannot be operated by depressing any key, 1 to 10, of the key-board proper of the instrument. The type-sector recesses in which the coupling-pins *c d e* fit are preferably flared, and the coupling-pins are pivoted to assure easy and certain engagement of them with the shaft 1^a of the key 1. (See Fig. 7 of the drawings.)

It is obvious that the third type-sector, 3^b, will normally be operated from the first key, 1, as the remaining type-sectors, 4^b, 5^b, 6^b, 7^b, 8^b, 9^b, 10^b, 11^b, and 12^b, are operated from the keys 2, 3, 4, 5, 6, 7, 8, 9, and 10, respectively; hence each of the ten keys of the key-board will

actuate its own type-sector, thus allowing ten characters to be brought into line for print by a depression of the ten keys simultaneously by the fingers of both hands of the operator for setting the type for printing an entire word or words by one depression of the rocking plate B, as hereinafter fully explained.

Before describing the operation of coupling the two left-hand type-sectors, 2^b and 1^b, by the keys D E, respectively, to the key-board key 1, I will explain the arrangement of the type on the twelve sectors of the instrument, as follows: The ten sectors 3^b to 12^b, inclusive, which are normally operated by the keys 1 to 10, respectively, each bear the same type-characters which are represented at the right-hand row of type on the first key, 1, in Fig. 1 of the drawings. I remark here incidentally that the keys 1 to 10 are made in thirty sections peculiarly jointed together, and each section bears one type-character, which, when any section of any key is depressed to the rocking plate B, will cause a corresponding type-character on the sector coupled to the key to be brought into line for print, all as hereinafter more fully explained. Each type-sector therefore carries thirty characters, which, like those on the corresponding sectional keys, range in order or succession from front to rear of the machine. The characters on the ten sectors 3^b to 12^b, inclusive, comprise the alphabet of small letters, twenty-six in all, and four punctuation-marks, the comma, semicolon, period, and hyphen. The characters on the sector 2^b comprise an alphabet in capitals, having the same relative positions on it as the small letters on the last above-named sectors, the character &, the dollar \$, the per cent. %, and the cent ¢. The characters on the sector 1^b comprise, successively, the fractions, the ten digits, and the special punctuation-marks, (clearly indicated at the left-hand side or edge of the key 1 in Fig. 1 of the drawings.)

If in the operation of the machine it is desired to print any one of the characters on the sector 2^b, the key D will be depressed by the left hand, and the pressure of the key on the lug *C'* of the lever C will lower the coupling-pin *c* from the shaft 1^a, which will uncouple the sector 3^b from the shaft, and at the same time the pin *d* on the key D will rise and couple with the shaft 1^a. If now a capital M is to be printed, the first key, 1, will be pressed down at its section marked *m*, which will cause the shaft 1^a to turn sufficiently to carry the type M on sector 2^b into line for print.

Should the character \$ be required while the key D is depressed, the key 1 will be depressed at its section marked \$, which will bring said character into line for print, and in this way any one of the characters on sector 2^b may be brought into line for print. Should any one of the characters on the extreme left-hand sector, 1^b, be desired, the key E will be depressed, which, by its contact with the lug *C'*, will uncouple the pin *c* of the le-

ver C from the shaft 1^a, and will simultaneously lift the pin *e* of the key E into its opening in the shaft 1^a, thereby coupling the sector 1^b to the shaft, and while the key E is held down the key 1 will be depressed at any section of it bearing the desired character, which shall be brought into line for print, as will readily be understood. When the keys D E are released, the springs *c*² *d*² *e*² will readjust the parts to uncouple the keys D E and couple the sector 3^b again with the first key, 1, of the key-board to cause said key to operate said sector 3^b to bring into line for print any of the characters at the right-hand edge of the key, as above explained.

The plate B rocks with its shaft *b*, and is normally held upward at its front or outer end by springs F, which force the back end of the plate down to a stop lug or lugs, *b*², on the bed-plate A, and the springs will yield to allow the plate B to be lowered at its front end to a stop, *b*³, on the bed-plate for lifting the sectors and giving the impression on the paper held to the carriage above them of either or all of the type-characters which had previously been brought into line for print by depressing the sectional keys 1 to 10 to the plate B, as will be hereinafter more fully explained. Springs G, fixed at one end to each of the type-sectors and at their other ends to the plate B, normally draw the sectors backward against a stop-bar, *g*, which is fixed in or forms a part of the frame H, on which the paper-holding carriage and inking devices are supported, as presently described.

The key-board keys are made alike in general form, except that they are successively made longer from the key 1 to the key 10 at their back parts behind the axis of the transverse shaft 1^a, which supports them and the type-sectors. The object of this successive rearward prolongation of the keys is to cause them to act with a varying leverage beneath and over a series of shoulders formed at the front edge of a tilting plate, I, which I call the "spacing-plate," and by which and connected mechanism the feed of the carriage is regulated automatically, as hereinafter fully explained.

The front parts of the keys 1 to 10 being made alike, a description of this part of one key will suffice, as follows: It consists of a number of sections, K, which are provided with a tenon, *k*, at one end and a mortise, *k*¹, at the other end, each section having squared ends or shoulders *k*², and the tenons being rounded over a little at their lower edges, so that when the sections are hinged or connected together pivotally by pins *k*³, which pass through the upper inner parts of the tenons, the key-sections will abut end to end, and will be practically a rigid or inflexible lever behind any one of the sections which may be depressed to the board B for setting the type-sector characters into line for print, and all those sections of the key in front of the one depressed will be free to fall upon or

follow the inclination of the plate B. The inner or rear section K of each key is connected to the rigid rear part or stem, J, of the key, which is fixed to the shaft 1^a or to its respective sleeve and projects rearward to the spacing-plate I. The last character is produced on the outer end of this rigid part J of the key, as shown in Fig. 1 of the drawings.

It is obvious that when the first or front section K of a key, 1 to 10, is depressed to the board B the type-sector connected to said key will be turned forward at its type-carrying face a sufficient distance to bring the first character *a*, A, or $\frac{1}{2}$ on the sector connected to said key immediately beneath the center of the impression-roll L on the paper-carriage, and should the second key-section K be depressed flat to the plate B the sector will be turned to carry its next character, *b*, B, or $\frac{2}{3}$, immediately beneath the roll L into line for print, and so on for any one of the key-sections K J, which, when depressed to the plate B, will carry a sector-character corresponding to that on it to the line of print.

It will be understood that the characters at the right-hand side of the first key, 1, in Fig. 1 of the drawings may be reproduced on each of the keys 1 to 10 of the instrument, or may be marked on every second or third key, or these characters may be produced on key 1 only, in which cases the eye will follow or line off the key-sections when depressing them by the characters on the intermediately-marked or first keys.

The paper-holding-carriage frame M consists of opposite side bars connected to and by opposite end bars, and is hinged at *m* to the rear frame, H, of the machine, and is provided with suitable grooves, *m*¹, forming ways or guides, in which the carriage N is fitted to slide transversely of the key-board, and allowing the carriage to be swung back with its frame on the hinges *m*, for inserting the paper or making erasures, or for other purposes. In the opposite ends of the carriage the above-named impression-roller L and two paper clamping and feed rollers, O O, are journaled. The roller L will preferably be made of rubber or other suitable elastic composition, and the rollers O O are made of wood, having rubber or felt rings *o*¹ *o*¹ at opposite ends to bear on the paper with sufficient friction to cause the paper to be positively fed forward underneath the impression-roller, when pinions *o* *o*, which are fixed to the shafts of the rollers O O and mesh with pinions *l* at the opposite ends of the shaft of the impression-roller, are turned a limited distance by the engagement of a pawl or trip-lever with the right-hand pinion *l* of the roller L, as hereinafter described.

The rear side bar, *n*, of the carriage N is provided with a rack, *p*, with which a pinion, P, fixed to a shaft, *p*¹, journaled in the frame H, is adapted to engage. The shaft *p*¹ extends across the frame H and carries at its

front end (see Figs. 2 and 9) an index or pointer, p^2 , which rotates with the shaft and indicates at the face of a graduated dial-plate, p^3 , fixed to the frame, the extent of movement of the carriage, and will also indicate how the carriage may be set by hand to commence a line of writing at any place across the page. A spring, R' , which is fixed at one end to the shaft p' and coils around said shaft, is fixed at its other end to the frame H. A ratchet-wheel, R, on the shaft p' has peripheral teeth of suitable pitch, which are engaged by a pawl, R^2 , which is pivoted at r to the spacing-plate I, and is guided and held upon the ratchet-wheel by the engagement with it of the outer forked end, r' , of the lever R^3 , which is pivoted by a long bearing-pin, r^2 , to the frame H. The ratchet and pawl are relatively arranged with the pinion P to cause the pinion to be turned to shift the carriage N from the right toward the left for variable distances or spaces to allow printing of from one to ten characters on the paper, accordingly as the spacing-plate I is lifted more or less by the back ends or stems of the depressed keys 1 to 10, and as the carriage is shifted from right to left the spring R' is coiled up or put in tension, ready to automatically move the carriage back to its extreme right-hand position when the detents are moved from the ratchet-wheel, all as hereinafter more fully explained.

A detent-pawl, R^4 , guided in a suitable eye or bearing, r^3 , fixed to the frame H, has a hook-head, r^4 , which normally engages the teeth of the ratchet-wheel R, to prevent return or back motion of the wheel and hold the carriage in the position to which it has been moved by the last action of the feeding-pawl R^2 . A pin, r^5 , fixed in the frame H, is preferably used to cause the pawl-head r^4 to move clear of the ratchet-wheel when the detent-pawl is raised, and a spring, r^6 , normally holds the pawl R^4 engaged with the ratchet-wheel. The pawl R^4 is bent over to the left hand to cause its lower part to clear the spacing-plate I, and the lower end, r^7 , of said pawl rests upon or has suitable connection with the extremity s of a lever, S, which thence ranges toward the right hand, and is bent forward and curved a little to clear the rocking plate B at a point where an upwardly-projecting paper-shifting pawl or arm, T, is connected to the lever, and said lever S extends along the frame H, to which it is fulcrumed at s' , and thence ranges forward beneath the plate B near the front of the key-board. A spring, s^2 , normally presses down the back end, s , of the lever, and at its forward end it carries a stem having a key or finger-plate, s^3 , which, when depressed, lifts the detent-pawl R^4 and disengages it from the ratchet-wheel R, and also disengages the feeding-pawl R^2 from the ratchet, which last effect is produced by means of a rod, T' , which is connected at one end to the arm T and at its other end is pivoted to one end of an elbow-lever, T^2 , which is pivoted at its angle to the frame H, and is pivoted

at its other end to a rod, T^3 , which is pivoted to the pawl R^2 , as will be understood from Figs. 1, 2, and 4 of the drawings. After the pawls R^2 R^4 are disengaged from the ratchet-wheel R, the arm T operates the paper-holding rollers on the retracted carriage N to move the paper forward to receive the following line of printing, as next described.

The arm T is fixed to the lever S at a point back of the lever-fulcrum, and at its upper end carries a pin, t , with which the teeth of the right-hand pinion l of the impression-roller L are adapted to engage. As the key s^3 of the lever S is depressed after a line has been printed on the paper U held by the carriage-rollers, the pawls R^2 R^4 will simultaneously be disengaged from the ratchet-wheel R, and the pin t of the arm T will be swung or carried over to a position forward of a vertical line drawn through the center of the impression-roller or its pinion l , so that when the carriage is thrown to its extreme right-hand or initial position by the operation of the spring R' , as above explained, and as the carriage stops against a lug, t' , on its frame M, and while the lever S is yet depressed at its key s^3 , the pin t of the arm T will engage or pass between two of the teeth of the adjacent roller-pinion l , and when the finger is lifted from the key s^3 the spring s^2 will instantly raise the lever S and throw back the pin t , and thereby turn the pinion l backward, and through it all the pinions l of the paper-holding rollers will be turned to move the paper U a proper distance forward to receive the next line of printing.

I will next describe the inking devices, and then explain how a depression of the keyboard keys imparts a variable feed to the paper-carriage, and, finally, I will briefly describe the general operation of the instrument in writing a word.

The inking device is made with a pair of spools, V' V^2 , which are journaled in suitable brackets or bearings, v v , fixed to the front and rear top bars of the frame H. The spools are long enough to receive an inking-ribbon, V, which is sufficiently wide to cover or overlie all of the twelve type-sectors of the instrument. The bearings v v will be arranged in any approved way allowing easy removal of the ribbon-rollers. The main body of the ribbon V will be wound upon the rear roller, V' , and its free end will be fastened by a tape or otherwise to the front roller, V^2 . A crank, v' , on the shaft of the roller V' allows the ribbon to be rewound onto said roller from the roller V^2 when the ribbon-feeding pawls W' W^2 are disengaged from ratchet-wheels w' w^2 , which are fixed to the shafts of the rollers V' V^2 , respectively. These pawls W' W^2 are preferably made with elastic stems, which are fixed to the head of an arm, W, which is also made of elastic material, and is fastened at its lower end at w to the post b' , which is fixed to and rocks with the plate B. The teeth of the ratchets w' w^2 are pitched

in the same direction, and the teeth of the pawls $W'W^2$, which engage them, are pitched in opposite directions, as most clearly shown in Fig. 3 of the drawings, and whereby as the plate B is rocked to imprint the paper the pawl W^2 will engage its ratchet w^2 to wind the ribbon V onto the roller V^2 , and the pawl W' will slip over the teeth of its ratchet w' as the back end of the plate B rises, and as this end of the plate B falls the pawl W^2 will slip over its ratchet, while the pawl W' will act on its ratchet w' to slack off the ribbon from the roller V' , and in this manner the inking-ribbon will be removed to carry a fresh part of it over or to the line for print every time the plate B is rocked to press the type and interposed inking-ribbon to the paper. A wedge-shaped trip-block, X, which is fitted upon the arm W, may be forced down between the arm and the bearing b' , to throw the pawls $W'W^2$ laterally and clear of the ribbon-spool ratchets $w'w^2$ whenever the ribbon is to be rewound onto the roller V^2 .

Regarding the variable feed of the carriage by depression of the key-board keys, it will be noticed that the extreme right-hand key, 1, extends by its rear part or stem, J, a shorter distance back of the axis of the sector-shaft 1^a than any other of the keys; or, in other words, the rear parts or stems or short arms of the key-levers are made successively longer from the key 1 to the key 10, as hereinbefore stated, and the spacing-plate I, which is journaled at opposite ends in boxes i' , (see Fig. 2,) which are fitted to slide from front to rear in suitable bearings on the rear frame, H, is provided with a series of ten shoulders, i , which are graded in length relatively to the short arms of the keys which act on them, so that the extremity of each key will lie under the spacing-plate a trifle next its respective shoulder i of the plate I when the plate is forced forward to its normal position by one or more springs, Y, which are fitted between its back edge and the frame H in any approved way. The upper face of the spacing-plate I, next each of its shoulders or steps i , is rounded or beveled backward from the lower face of the plate, to allow the extremities of the keys, when they shall have lifted or tilted the plate and passed above it, to more easily force the plate back bodily against the tension of the springs Y as the extremities of the keys are carried down below the plate again by the pull of the springs G on the respective sectors to which the depressed keys are connected. The spacing-plate is supported in normal position by a short post or lug, I', which is fixed to the rocking plate B. (See Figs. 2 and 4 of the drawings.)

At the front end of the rocking plate B a cross-bar, Z, is supported by lugs z , so as to extend above the ends of the first sections of all the keys, 1 to 10, inclusive, and prevent undue rising of the keys as they are operated, and this bar Z also serves as a spacing-bar, as by pressure on it the board B will be

depressed to the stop b^3 , and the spacing-plate I will be lifted or tilted by the lug I' a sufficient distance to cause the pawl R^2 to turn the ratchet R' and pinion P to move the carriage N the space required for one letter.

It is obvious that a depression of the first key, 1, will raise the forward edge of the spacing-plate I a comparatively slight distance, or through the same arc which the plate is tilted by pressure on the spacing-bar Z, to give the carriage N a like movement—say about one-tenth of an inch—toward the left hand, and when the key 2 is depressed in like manner the spacing-plate I will be swung or tilted upward a farther distance, or enough to move the pawl R^2 to shift the carriage N two-tenths of an inch, or to space for two characters, and in like proportion or ratio a depression of the keys 3, 4, 5, 6, 7, 8, 9, and 10 will actuate the pawl to shift the carriage three-tenths, four-tenths, five-tenths, six-tenths, seven-tenths, eight-tenths, nine-tenths, and ten-tenths of an inch, respectively. In other words, the carriage will be shifted from one-tenth of an inch to one inch as the keys 1 to 10 are correspondingly depressed. It will be understood that it requires a very slight movement of the keys to cause them to operate the spacing-plate and carriage-feeding pawl, as above described—that is to say, each key 1 to 10 will give its proper maximum movement to the spacing-plate when the first or outer section of the key is depressed, and will move or lift the spacing-plate no farther should any other inner or rear section of the key be depressed to the rocking-plate B to bring the proper type on its sector into line for print.

To illustrate the operation of the machine, we will suppose the word "Received" is to be written. The operator will depress the key D to couple the sector 2^b , carrying the capitals to the key 1, and he will then depress the key 1 at its section marked r to the plate B, which moves the sector 2^b to carry its character R into line for print, and then the operator presses on the sector r of key 1 with sufficient force to lower the plate B to its stop b^3 , which will carry all the sectors upward, but will print only the capital R on the sector 2^b , as all the other sectors are behind the line of print, and when the hands are lifted from the machine the sector 3^b will be automatically recoupled to the key 1. After the capital letter R is printed, the required sections of the keys from 1 to 7, to bring into line for print the letters e c c i v e d, are struck all at the same time together and continuously depressed to rock the plate B to make the impression. The rocking of the plate B depresses the section e of key 1, the section c of key 2, the section e of key 3, the section i of key 4, the section v of key 5, the section e of key 6, and the section d of key 7, which will set the sectors 3^b , 4^b , 5^b , 6^b , 7^b , 8^b , and 9^b to bring the letters e c c i v e d in order from left to right into line for print, and by the setting

of these sections of the keys, or rather by the depression of the key 7, the carriage had been moved by the spacing-plate I and pawl R² for seven-tenths of an inch, or a space sufficient to print all the letters of the word except the capital R, just printed, and while the depressed sections of the several keys are held snugly to the board B the pressure will be increased to rock the board and carry the sectors up to the inking-ribbon and impress the paper to print all seven letters at once and complete the word, and when the hands are lifted the keys and sectors will resume their normal positions ready for the next depression of the keys to the plate B to move the desired sector-characters into line for print.

The operation in detail of the carriage returning or retracting mechanism, the inking devices, and the mechanism for shifting the paper for the next line of print will be fully understood from the aforesaid description; hence it is only necessary to state that when a line of printing is completed the key-plate s³ of the lever S will be depressed and released, and the lever-connections will first release the pawls R² R⁴ from the ratchet-wheel R and allow the spring R' and pinion P to retract the carriage and cause the arm T t to shift the paper for the next line of printing.

Words may be spaced apart either by depressing the bar Z without depressing any of the keys or by skipping one or more keys when depressing them to the rocking plate B for setting the sectors to the line for print. It will be seen that whole words or phrases can be type-written with or by a single depression of the keys, enabling writing to be done at a reporting speed.

It is obvious that it is not necessary to use ten keys, as herein shown and described, as a less number may be used with a corresponding number of normally-connected sectors or reciprocating type-carriers and as many additional sectors having coupling-keys, by which they may be connected to a keyboard key to bring any capital or other special character into line for print.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a type-writer, the combination of a series of oscillating type-carriers, a series of keys connected, substantially as described, to and operating the said type-carriers to bring the type into line, and a rocking plate upon which the said type-carriers and keys are mounted and by which the type-carriers are elevated to make the impression, substantially as described.

2. In a type-writer, the combination of a series of oscillating type-carriers and a series of keys, each composed of a number of sections hinged together, connected, substantially as described, to and operating the said type-carriers to bring one or more of the type into line at once, substantially as described.

3. In a type-writer, the combination of a

series of oscillating type-carriers, a series of keys, each composed of a number of sections hinged together, and connected, substantially as described, to and operating the said type-carriers to bring one or more type into line, and springs for returning the type-carriers and keys to their normal position, substantially as described.

4. In a type-writer, the combination of a series of oscillating type-carriers, a series of keys, each composed of sections hinged together, substantially as described, and connected, substantially as described, to and operating the said type-carriers to bring the type into line, a rocking plate upon which the said type carriers and keys are mounted and by which the type-carriers are elevated to make the impression, and springs for returning the type-carriers, keys, and rocking plate to their normal position, substantially as herein set forth.

5. In a type-writer, the combination, with a frame and a paper-carriage thereon, of a series of oscillating type-carriers, a series of keys connected, substantially as described, to and operating the type-carriers to bring the type into line and having their inner ends of varying lengths, a pivoted spacing-plate having a series of shoulders, and intermediate mechanism, substantially as described, between the spacing-plate and the paper-carriage for operating the same, substantially as herein shown and described.

6. In a type-writer, the combination, with a frame and a paper-carriage thereon, of a series of oscillating type-carriers, a series of keys, each composed of hinged sections connected to and operating the said type-carriers to bring the type into line and having their inner ends of varying lengths, a rocking plate upon which the said type-carriers and keys are mounted and by which the type-carriers are elevated to make the impression, springs for returning the type-carriers, keys, and rocking plate, a pivoted spacing-plate having a series of shoulders, a pawl on the spacing-plate, and mechanism, substantially as described, operated by the pawl to shift the paper-carriage, substantially as herein specified.

7. In a type-writer, the combination of a frame, a paper-carriage thereon, a rocking plate, B, fulcrumed on the frame, a shaft, 1^a, held in bearings on the plate B, a series of keys, as 1 to 10, supported independently by a series of hollow shafts from said shaft 1^a, a series of type-carrying sectors, as 3^b to 12^b, connected to the key-shafts to be rocked by or from the keys to carry the type into line for print, springs retracting the rocking plate, the type-carrying sectors and the keys, and an impression roller or platen on the paper-carriage opposite the type on the adjusted sectors, substantially as shown and described.

8. In a type-writer, the combination of a suitable frame, a paper-carriage thereon, a rocking plate, B, fulcrumed on the frame, springs F and stops for said plate, a shaft, 1^a, on the

plate B, a series of keys, as 1 to 10, supported independently from said shaft and having rear stems of varying lengths, a series of type-carrying sectors, as 3^b to 12^b, connected to the respective key-shafts to be rocked by or from the keys to bring the type into line for print, springs G, retracting the sectors and keys, an impression roller or platen on the carriage opposite the type on the adjusted sectors, a spacing-plate, I, having a series of shoulders, *i*, normally overlapping the keys, and said plate I fitted to the frame so as to yield to let the ends of the keys pass the shoulders, a stop, I', for the plate I, a pawl, R², connected to the plate I, a shaft, *p'*, a ratchet-wheel, R, thereon, actuated by the pawl R², and a pinion, P, engaging a rack on the paper-carriage, substantially as described, for the purposes set forth.

9. In a type-writer, the combination of a frame, a paper-carriage thereon, a rocking plate, B, fulcrumed to the frame, a shaft, 1^a, on the plate B, retracting-springs and stops for said plate, a series of keys, as 1 to 10, supported independently from the shaft 1^a and having rear stems of varying lengths, a series of type-carrying sectors, as 3^b to 12^b, connected to the respective key-shafts, an impression roller or platen on the carriage, a spacing-plate, I, having a series of shoulders, *i*, normally overlapping the keys, a pawl, R², connected to the plate I, a shaft, *p'*, a ratchet-wheel, R, thereon, actuated by the pawl, a pinion, P, engaging a rack on the carriage, a spring, R', connected to the frame and to the shaft *p'* and adapted to be put in tension as the carriage is shifted by the pawl, a retaining-pawl, R⁴, having a hook-head, *r*, engaging the ratchet-wheel to lock the carriage when shifted by the pawl and pinion, the pin *r*⁵, for engaging the head of the pawl to disengage it from the ratchet-wheel, and a lever for raising the said pawl, substantially as described, for the purposes set forth.

10. In a type-writer, the combination, with a frame, a paper-carriage thereon, a rack-and-pinion device adapted to shift the carriage, and a pawl, R², connected to a pivoted spacing-plate operated by the keys for actuating the pawl, substantially as specified, of a lever, S, fulcrumed to the key-board support and having an arm, T, the elbow-lever T², pivoted to the frame, the rod T', pivoted to the arm T and elbow-lever T², and the rod T³, pivoted to the elbow-lever and to the pawl R², substantially as herein set forth.

11. In a type-writer, the combination, with a frame, a paper-carriage thereon, a rack-and-pinion device adapted to operate the carriage, a pawl, R², connected to a pivoted spacing-plate operated by keys for actuating the pawl, a ratchet-wheel, R, a spring, R', on the ratchet-shaft, and a retaining-pawl, R⁴, for the ratchet and carriage, of a lever, S, fulcrumed to the key-board support and having an arm, T, the elbow-lever T², pivoted to the frame, the rod T', pivoted to the arm T and to the elbow-le-

ver, and the rod T³, pivoted to the elbow-lever and to the pawl R², said lever S extended to the detent-pawl R⁴, substantially as shown and described, whereby as the lever is depressed at *s*³ both pawls R² R⁴ will be disengaged from the ratchet-wheel R to allow the spring R' to automatically retract the carriage, as herein set forth.

12. In a type-writer, the combination, with a frame, a paper-carriage, N, sliding thereon, a paper-roller in the said carriage, a pinion on the end of the paper-roller, a lever, S, having an arm, T, carrying a pin, *t*, a ratchet-and-pinion device, *p'* R P, adapted to feed the carriage, a spring, R', adapted to retract the carriage, a feeding-pawl, R², connected to a pivoted spacing-plate operated from the type-keys, and a retaining-pawl, R⁴, substantially as shown and described, whereby as the lever S is depressed at *s*³ the pawls R² R⁴ will be disengaged from the ratchet-wheel R to allow the spring to retract the carriage, and the pin *t* of the arm T will be set to engage a pinion on a paper-roller of the retracted carriage, and when the lever S is released the carriage-rollers will be actuated by the pin *t* to shift the paper for the next line of printing, as herein set forth.

13. In a type-writer, the combination, with the frame, a sliding carriage thereon, paper holding and feeding rollers mounted in the said carriage, and pinions on the ends of the rollers and meshing with each other, of the lever S, provided with the arm T, having an inwardly-projecting pin, *t*, and a spring for returning the lever to its normal position, substantially as described, whereby when the lever is depressed the arm will be swung forward with its pin between the teeth of the pinion of one of the feed-rollers, ready to move the said roller by the action of its spring when released, as set forth.

14. In a type-writer, the combination of a series of keys forming a key-board, a rocking plate pivoted to the frame and to which the keys may be depressed, said keys being connected independently to a series of oscillating type-carriers adjustable by depressing the keys to bring the type into line for print, and springs retracting the type-carriers and keys, and said keys having inner parts or stems varying in length, a pivoted spacing-plate having a series of shoulders normally overlapping the keys, a pawl connected to the spacing-plate, and mechanism, substantially as specified, operated by the pawl for shifting the paper-carriage, a stop, *b*³, for the rocking plate, and a stop, I', fixed to said plate and adapted, when the plate is rocked by pressure on said bar, to operate the pawl for feeding the paper-carriage to space words apart and, without operating the type-carriers, to adjust the type into line for print, substantially as shown and described.

15. In a type-writer, the combination of a series of keys forming a key-board and connected to independent type-carriers, and

adapted, when depressed, to operate the carriers to bring the type on them into line for print, and said keys having characters produced on them corresponding to those on the carriers, in combination with one or more special type-carriers bearing capitals and other special characters, and a lever and one or more special keys and pins arranged to couple the special carriers to the shaft of the first key and simultaneously uncouple said key from the type-carrier to which it is normally connected, and said first key bearing characters like those on the type-carriers connected to the key-board keys, and also bearing characters corresponding with or indicating those on the special type-carriers, which may be coupled to it, substantially as described, for the purposes set forth.

16. In a type-writer, the combination, with a frame, a rocking plate, B, fulcrumed thereon, a series of keys, as 2 to 10, supported independently from a shaft, 1^a, held to the plate B, a series of type-carriers, as 4^b to 12^b, inclusive, fixed to shafts on which the keys 2 to 10, respectively, are supported, and said type-carriers having a series of like characters corresponding with the characters of the keys to which they are normally connected, a key, 1, fixed to the shaft 1^a, type-carriers 3^b 2^b 1^b, mounted loosely on said shaft 1^a, and the carrier 3^b, having a series of characters corresponding with those of the carriers 4^b to 12^b, and adapted for connection with a key, 1, which is held to the common shaft 1^a, a spring-actuated lever, C, fulcrumed on the plate B, and having a pin, c, normally entering the carrier 3^b and coupling it to the key 1, and said lever C having a lug, C', and spring-actuated keys D E, fulcrumed on the plate B, and provided, respectively, with coupling-pins d e, entering type-carriers 2^b 1^b, and adapted, when the keys D E are depressed,

to engage the pins d e with the shaft 1^a, to couple the carriers 2^b 1^b, respectively, to said shaft and to simultaneously uncouple the carrier 3^b from the shaft, substantially as shown and described, whereby either of the carriers 2^b 1^b, having capitals or other special characters, may be operated at will from the key 1 of the key-board, and said key 1 also bearing characters corresponding with or indicating those on the carriers 2^b 1^b, all operating as and for the purposes set forth.

17. In a type-writer, the combination, with a frame, a rocking plate fulcrumed thereto and supporting a key-board, and a series of reciprocating type-carriers adapted to be adjusted by operating the keys and to be lifted to make an impression by tilting the rocking plate, substantially as specified, of a pair of inking-ribbon rollers, V' V², journaled on the frame, a ribbon, V, on the rollers and next the type, ratchet-wheels w' w² on the shafts of the rollers V' V², and pawls W' W², engaging the ratchets and connected to a rod, W, held to the rocking plate, substantially as shown and described, whereby as the rocking plate is tilted the pawls W' W² will shift the inking-ribbon, as and for the purpose set forth.

18. In a type-writer, the combination, with the operating-rollers V' V², provided with ratchet-wheels w' w², pitched in the same direction, and the rocking plate B, of the elastic pawls W' W², having their teeth pitched in opposite directions and secured to the elastic arm W, which is secured to the rocking plate B, substantially as herein shown and described.

LEBBEUS G. GARRETT.

Witnesses:

JOHN H. GIES,

W. E. SCHAFFUIT.