

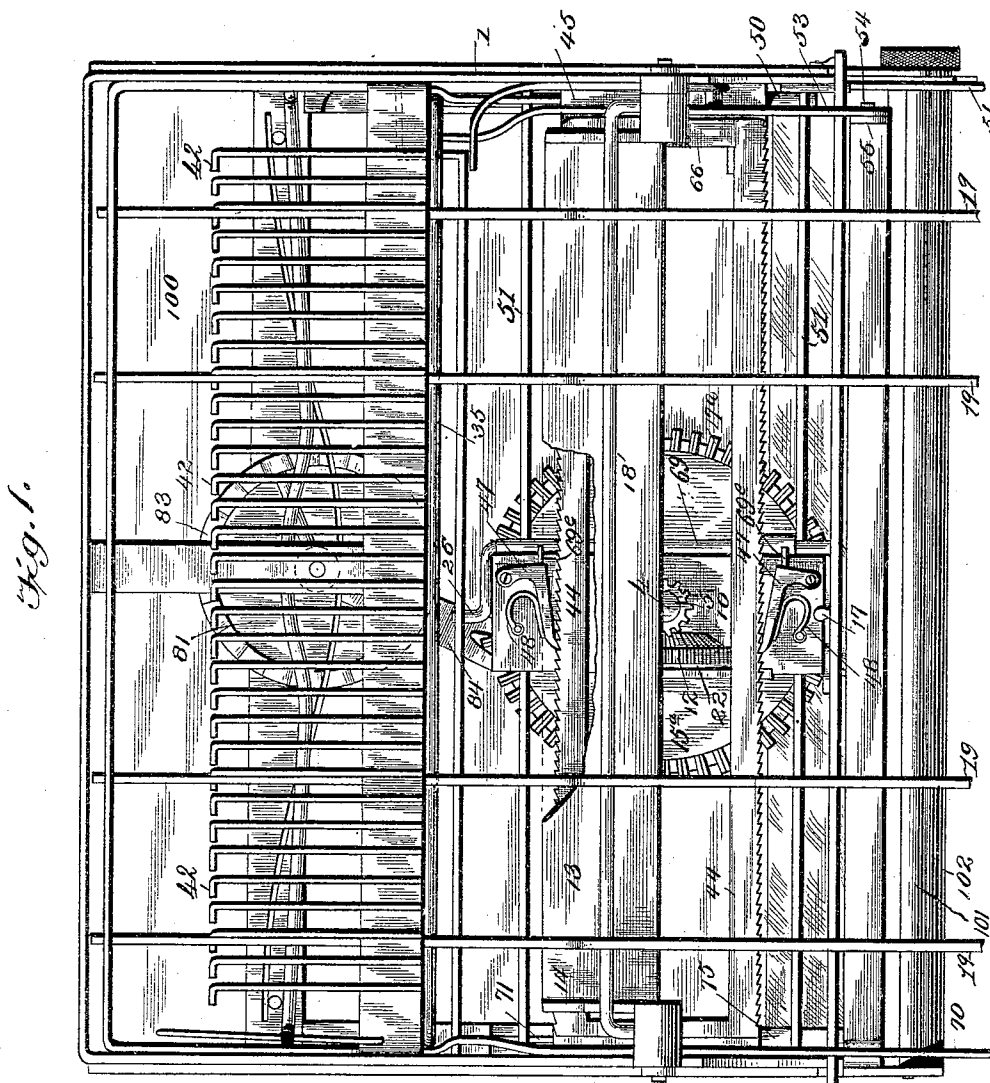
(No Model.)

5 Sheets—Sheet 1.

J. JACKSON.
TYPE WRITING MACHINE.

No. 529,387.

Patented Nov. 20, 1894.



Witnesses
John D. Smith
Chas. B. Vilden

By

John Jackson
James L. Norris
his Attorney

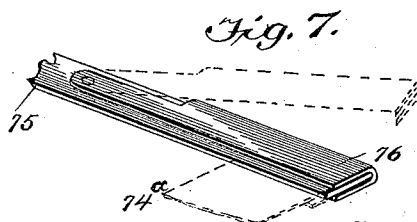
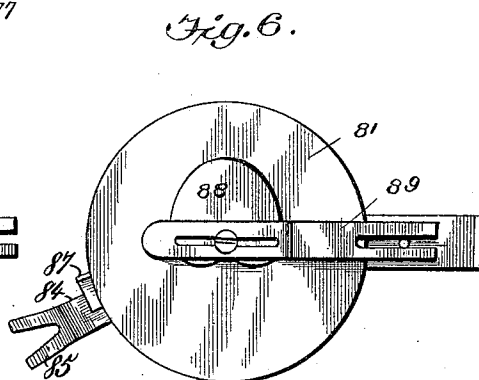
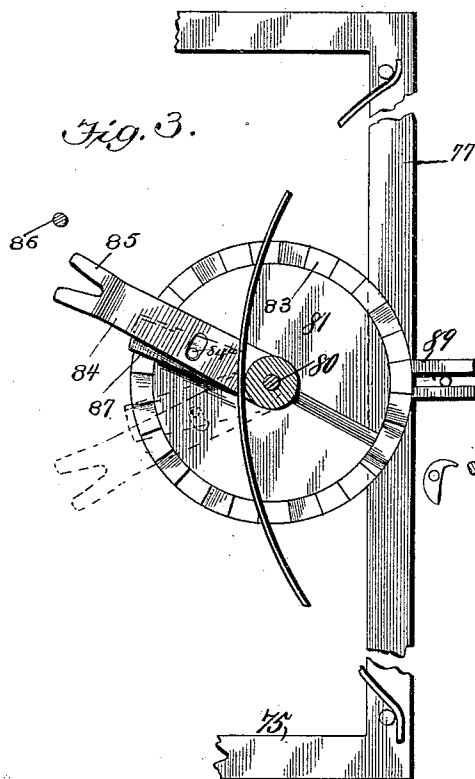
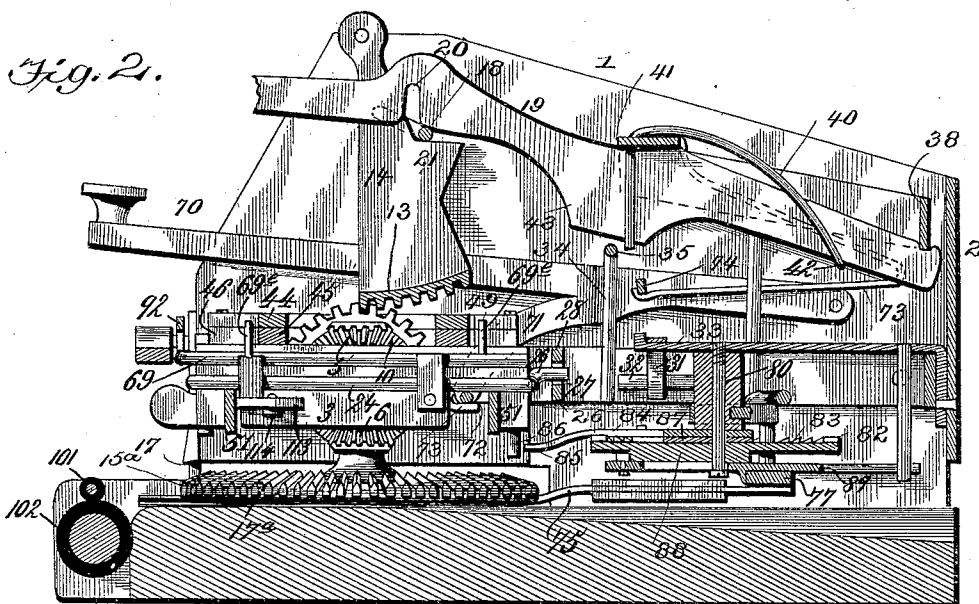
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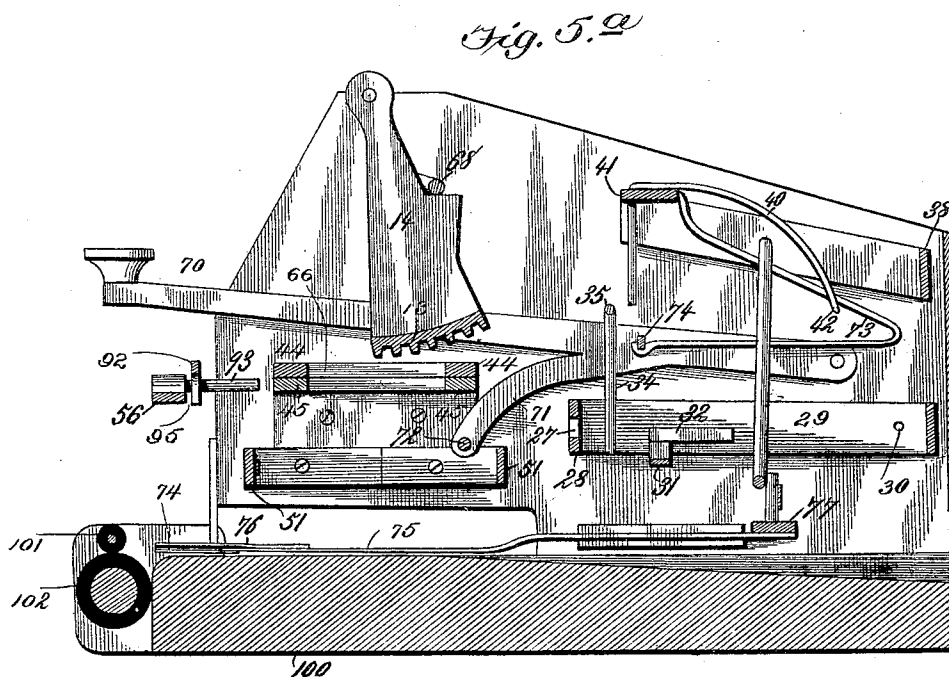
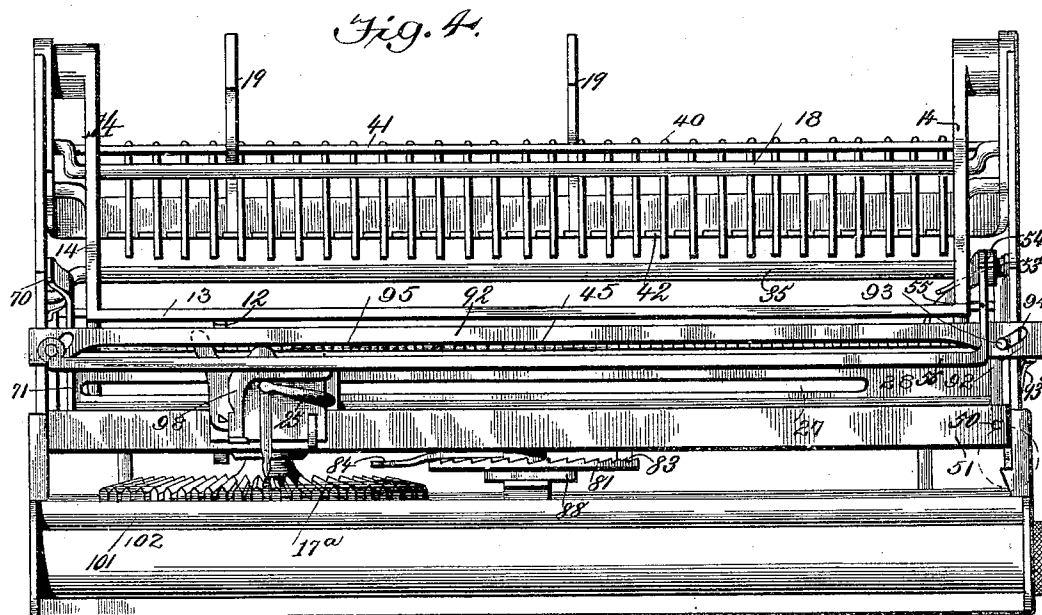
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5 Sheets—Sheet 3.

J. JACKSON.
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No. 529,387.

Patented Nov. 20, 1894.



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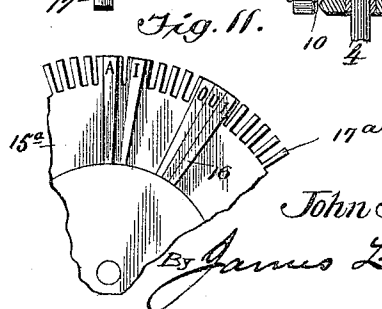
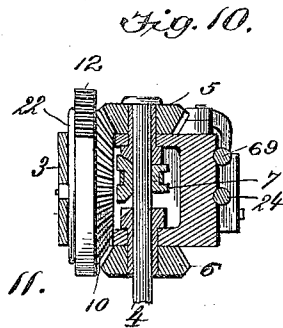
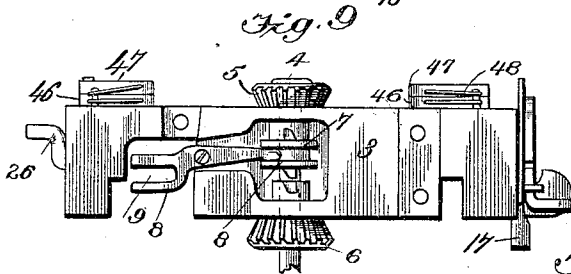
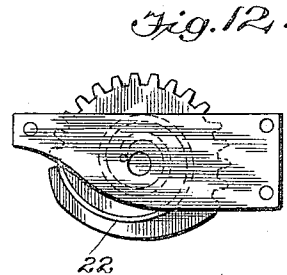
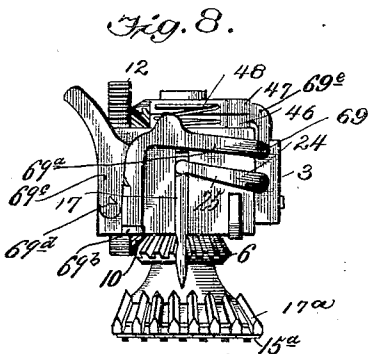
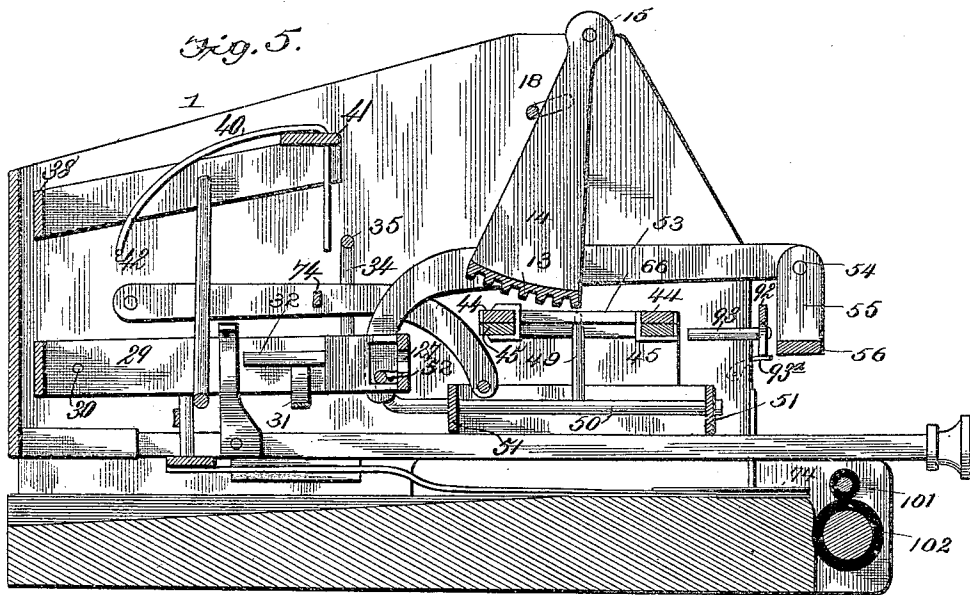
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5 Sheets—Sheet 4.

J. JACKSON.
TYPE WRITING MACHINE.

No. 529,387.

Patented Nov. 20, 1894.



Witnesses

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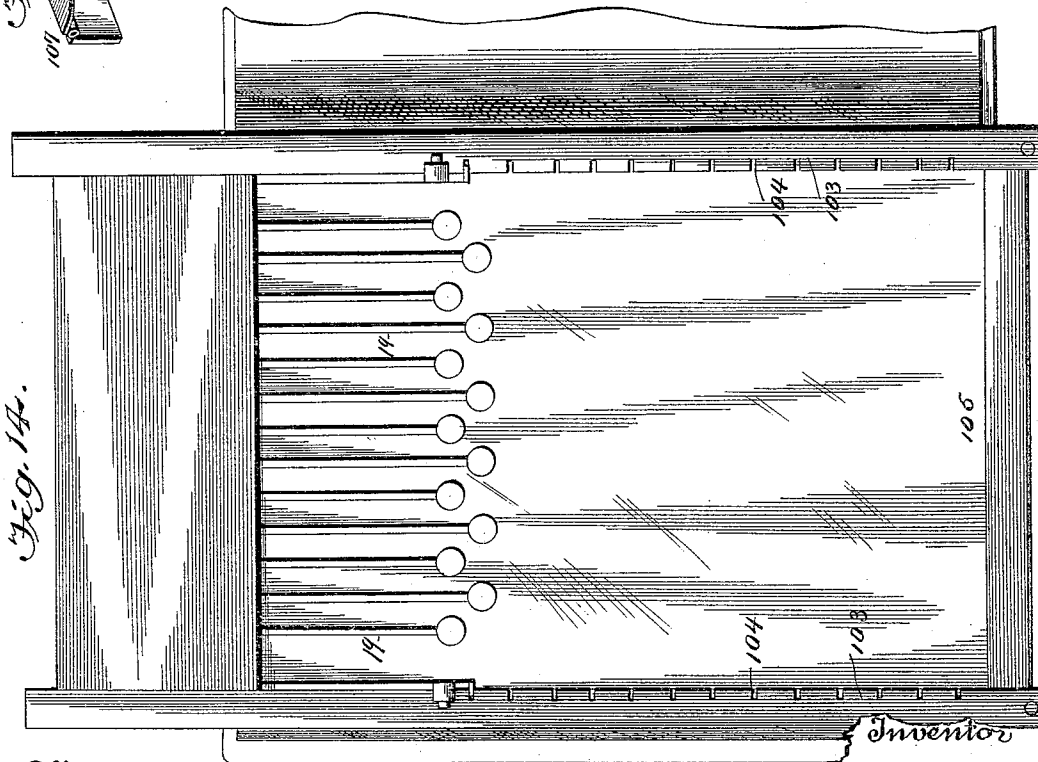
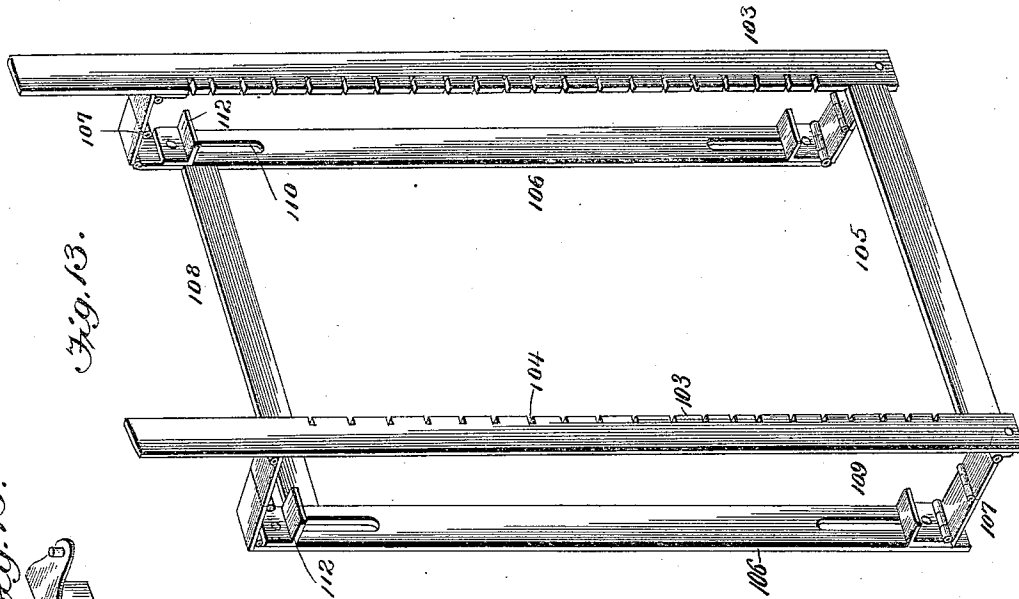
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5 Sheets—Sheet 5.

J. JACKSON.
TYPE WRITING MACHINE.

No. 529,387.

Patented Nov. 20, 1894.



Witnesses

John Jackson
Chas. B. Alden

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his Attorney.

UNITED STATES PATENT OFFICE.

JOHN JACKSON, OF CLINTON, IOWA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 529,387, dated November 20, 1894.

Application filed November 9, 1892. Renewed February 17, 1894. Serial No. 500,579. (No model.)

To all whom it may concern:

Be it known that I, JOHN JACKSON, a citizen of the United States, residing at Clinton, in the county of Clinton and State of Iowa, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to type-writing machines, and especially to that class of such machines in which the type-carriage has an intermittent feed, while the whole machine when used upon a book is given a separate movement for the line-space.

It is one purpose of my invention to provide a novel means for effecting these movements and to improve the construction of the key-levers by which the differential movement of the type-disk and the intermittent feed of the type-carriage are effected.

It is my purpose also to effect the several type-selections by means of the differential movement of a single selecting-gear and to effect the differentiation of this movement in such manner that the several movements of the type-disk shall be, for lower-case letters, always in the same direction and for upper-case, or caps, in the opposite direction. This part of my invention also includes means for shifting the devices by which the type-disk is enabled to make the two opposite movements for upper-case and lower-case.

It is a further purpose of my invention to combine with the type-carriage and with the devices whereby said carriage is given an intermittent feed-movement for the letter-space, means whereby all side-displacement or lateral inaccuracy of movement will be prevented, thereby giving a perfect and accurate alignment to every letter struck. I also propose to provide a novel and simple feed-movement for the type-carriage and to cause the type-carriage to automatically return to its position at one end of each line, the means by which this is accomplished being such that the line shall be complete, in all cases, according to the division of words and punctuation followed by the operator.

It is one special purpose of my invention to provide a book-type-writer which may be used on ledgers or record-books of any kind, in which the line-space shall be made by the movement of the entire machine, and to make provision, for effecting this movement by means of such simple character that the machine may be adapted to books of any kind and of any different line-spacing. Most of the devices heretofore used for this purpose have been complicated in construction and it is one purpose of my invention to provide a leaf-holder of simple form by which each side of the book may be held perfectly flat, and in suitable position for the feed-movement of the type-writing machine, or with both surfaces, back and leaf, substantially in the same horizontal plane, it being, however, one feature of this invention that each of these leaf-holders shall be independently adjustable.

It is my purpose, also, to provide a type-writing machine in which the ink-ribbon shall be not materially greater in length than the line-length and to combine with the ribbon-holding devices simple means whereby the ribbon shall have an automatic feed of limited extent at right angles to the line of movement of the type-carriage, given at the end of each line, or at either end of the line, as the case may be, whereby a new or fresh inking-surface is provided for each line, as far as the width of the ribbon extends.

Finally, it is the purpose of my invention to combine with the machine and with the frame upon which its operative parts are mounted, a guide whereby the movement of the type-writer by which the line-space is formed may be easily and accurately effected, the construction of these parts being such that the type-writing machine shall move upon the page upon which it is making its imprint.

It is also one purpose of this invention to provide a base or foundation-piece upon which the type-writer may be mounted and by which the paper may be supported, when single and separate sheets are used, and to combine with this base means whereby the ordinary paper-feed may be effected, when single sheets are used, in a manner similar

to that used in the Remington and other type-writers in which a paper-cylinder is employed to give the line-space.

To enable others skilled in the art to fully understand, make, and use my invention, I will now proceed to describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of a machine constructed in accordance with my invention. Fig. 2 is a vertical section taken at right angles to the line of movement of the type-carriage, one of the interior ends of the machine being shown in elevation. Fig. 3 is a partial plan view, showing in detail the devices whereby the ink ribbon receives its movement at the end of a line. Fig. 4 is a front elevation of the parts shown in Fig. 1. Fig. 5 is a sectional elevation of one of the interior ends of the machine, showing part of the mechanism illustrated in Fig. 2. Fig. 5^a is a sectional elevation of the interior end-face of the machine, showing the opposite ends to that illustrated in Fig. 5. Fig. 6 is a detail plan view of certain parts of the mechanism shown in Fig. 3. Fig. 7 is a detail perspective of the devices by which the ink ribbon is held or clamped at the ends on the ribbon-stretching-frame. Fig. 8 is a detail, front elevation of the type-carriage, showing the gearing by which the differential movement is effected in the type-selection, and, also, showing the plunger and rectifier by which the alignment is rendered accurate and by which, also, the type are struck and impressed. Fig. 9 is a side elevation of the type-carriage and of the parts shown in Fig. 8. Fig. 10 is a vertical section, partly in side-elevation, of the mechanism shown in Fig. 8. Fig. 11 is a broken segment in plan of the type-disk, showing the elastic arms upon which the type are mounted, and the teeth by which the alignment of the type is effected. Fig. 12 is a detail elevation of the spur-gear on the type carriage, to show the spring by which the type disk and segment-gear are returned to normal position after each type-selection. Fig. 13 is a perspective view, showing the book holder or leaf holder. Fig. 14 is a plan view of the same. Fig. 15 is a detail view, in perspective, of one of the jointed plates by which the parallel movement of the leaf-holding plates is effected.

In the said drawings, the reference numeral 1 denotes the side-pieces of the type-writer frame, in which the larger number of the mechanical parts have support. Ordinarily, I make these pieces of metal plate, although they may be of skeleton form, if preferred.

The general form of the machine is rectangular; and the numeral 2 indicates the back portion of the frame, the front being entirely open.

In my present invention, the type I prefer to form of steel, and to mount the same upon the extremities of elastic strips or arms, which radiate from the center of a type-disk, which

forms part of the type-carriage, this disk having a rotary movement to effect the type-selection and an intermittent movement for the letter space. In this respect, the invention is not substantially different from that in my former applications, Serial Nos. 413,309 and 413,310, both of which were filed on the 27th day of November, 1891. In this invention, however, the feed of the type-carriage is effected by entirely different means, and I will describe this feature as this constitutes one of the elements of my present invention, the object being to give a perfect and accurate alignment with the least possible number of parts.

The type-carriage consists of a housing or casing 3 within which is supported a vertical shaft 4, upon which are mounted two bevel gears 5 and 6. The shaft upon which these gears are mounted is fixed in the housing 3 but upon said shaft is keyed a clutch 7 operated by a clutch lever 8, provided with a forked end 9. By shifting this clutch upon the vertical shaft of the type-carriage, one of the two bevel gears on said shaft is locked to the shaft 4, which is thereby caused to revolve in one direction, or the other, by means of a bevel-gear 10 upon a horizontal axis, journaled in suitable supports in the type-carriage, and receiving its impulse or movement from a spur gear 12, formed or mounted upon the bevel gear 10, and of somewhat greater diameter. The movement of this spur gear is given by means of a long segment gear 13 extending the entire length of the machine, and mounted upon hanging arms 14 pivoted at a point above the type-carriage, as shown by the numeral 15 in Fig. 5. This segment gear is formed upon a comparatively large radius, but is of short arc, as the movement of the type-disk, in order to obtain the different type selections, is of comparatively limited extent. This disk consists substantially of a gear 15^a of suitable diameter mounted upon the vertical shaft 4. It is provided upon its periphery with a series of beveled projections corresponding closely to gear teeth in form, but having no gear connection with any other part of the mechanism. These teeth are beveled upwardly and outwardly for the rectification of the position of the type and for the securing of proper alignment.

The type, which are composed of two series of upper and lower case letters, are mounted upon elastic arms 16, radiating from the center of the type-disk upon its lower surface, the type being formed upon the lower faces of these arms at or near their extremities, and being arranged so as to lie between the projecting points of the disk, where they will be in the path of a striker or plunger 17 mounted upon the forward end of the carriage, and having reciprocation by means presently to be described.

By reference to Fig. 8 of the drawings, it will be seen that the lower end of this plunger or striker is beveled on both sides to a sharp

edge to enable it to enter between the projections of the type-disk and center the same, or bring the type into proper alignment by a slight rotary movement in all cases wherever the type-disk may have stopped short of its proper point or been carried by its own momentum past this point. By this device the correction in the alignment can easily be effected by a very slight rotary movement in either direction produced by the beveled point of this plunger.

In order to effect the different selections of type of the same character as, for example, for letters of lower case or small letters as distinguished from capitals, it is desirable that the type-disk shall always have rotation in one and the same direction, as these letters are all arranged therein in separate series of letters from the capitals or other pattern of type. In changing, however, from one series of letters to the other the successive partial rotations of the type-disk will be in the opposite direction, but by the same movements of the segment gear 13. Moreover it will be seen, by Fig. 2 of the drawings, that the engagement of this gear with the spur gear 12 on the type-carriage is such that an extremely limited swing of the segment gear will produce all the movement that is necessary for making type-selections over half, or nearly half, of the type-disk, and it will, also, be seen that these movements of selection will, also, be made in one and the same direction of movement of both of these gears. This differential movement is effected by the following means: Upon the two side walls of the casing of the machine are mounted pivotal supports for a bar 18, which I term the selection bar, because it is by its movements of different extent that the type-selections are effected. This selection-bar runs from one side of the machine to the other parallel with the line of movement of the carriage and above or nearly above said carriage. Over this bar and transverse thereto extend the several key-levers 19. These levers are of similar construction, so far as any essential feature is concerned, but are differentiated one from the other by means of the different positions of a slot 20, formed in the lower edge of each lever at a greater or less distance in front of the selection bar. In rear of this slot, the edge of the lever rests upon the selection bar, and the latter in turn is rested upon angular projections 21 upon the rearwardly and downwardly inclined edges, or upon the rear edges of the arms 14 which support the segment-gear 13. These edges or projections 21 are of such form that the selection bar is raised or turned toward the rear, and its angular ends by which it is pivoted upon the walls of the machine are supported in nearly a horizontal position, so that the push or action of the type-levers 19 upon the selection bar will turn the latter downward and forward, and, at the same time, swing the segment gear 13 toward the front. As this gear meshes with

the spur gear 12, and as the teeth of the segment gear are of a length nearly equal to the width of the housing or frame of the machine, the movement of the carriage as it is fed from one side to the other will not affect the meshing engagement. The differential movement of the selection bar is effected entirely by the difference in the length of the key-levers from the point where they are fulcrumed to the point where the slot 20 is formed with relation to the selection bar. Thus, it will be seen that in order to swing the bar forward far enough to enable it to enter the slot in the key-levers, there will be a difference of movement depending entirely upon this difference in distance through which the selection bar must be swung to enable it to enter this slot.

In my previous invention, hereinbefore referred to the several key-levers were all of exactly the same construction with their slots arranged in line parallel with the movement of the type-carriage; but the selection-bar was arranged at a small angle with said line of movement. In my present invention I arrange the selection bar in exact parallelism with the line of movement of the type-carriage, and effect the differential movement of the key-levers by the difference in the position of the slots 20, thereby giving a different extent of the cam edges of the key-levers acting upon the selection-bar, and giving in each case a different length of movement or swing, which is imparted by said selection bar to the segment gear. This segment gear 13 is returned to normal position in all cases by a spiral spring 32, coiled upon or around the axis of one of the intermeshing gears upon the type-carriage, the tension of this spring being such as to produce a retrograde movement of the system of gears by which the movement imparted by the segment gear is transmitted to the type-disk. These parts have any suitable construction and attachment, and it will be readily understood that all the means by which movements of ordinary character are produced may be capable of wide variation in construction and combination of parts. Many of the elements heretofore referred to are common to this case and to my previous inventions, shown in my prior applications already referred to, and I will make no reference thereto, save what may be necessary in order to give a clearer understanding of my present invention.

The rectifying and type-impressing plunger 17 is so arranged as to pass down between the fringe of projections 17^a upon the type-disk and by its downward movement bring the disk into correct position to effect an accurate alignment of the type-impressions, which are all effected by the impact of the plunger upon the ends of the type-arms upon the extremities of which the types are formed or mounted, the downward pressure of the plunger being received directly over the point of attachment of the type, or nearly

so, thereby depressing the elastic type-arms and driving the type against the ink-ribbon and paper, which lies beneath, this type-impression being made directly after the correction of position of the type-disk which carries these type-arms and both functions being accomplished by the same device. The lower end of the plunger 17 is beveled upon each side to a point, the bevel being of such an angle as to adapt it to enter between the fringe of projections 17^a upon the periphery of the type-disk, each of which is beveled at an angle opposite to that of the plunger, the latter being normally in such position that its doubly beveled point will just clear the beveled projections on the type-disk. By this construction, as the plunger is driven downward it first engages the beveled face of one or the other of these projections 17^a and gives a slight rotary movement to the type-disk in one direction or the other, thereby bringing the type-carrying arm 16, which carries the type selected by the key struck, directly beneath the point of the plunger, and in such position as to give exact and accurate alignment of the letter in every instance. The rectification of the position of the type-disk, which may, at any time, be carried by its own momentum, a little beyond the point of accurate alignment, or which may be arrested a little short of said point, is effected by the same device which impresses the type and prints the letter an instant after this rectification is effected. The movement of this plunger is effected by a rock shaft 24, which is mounted in any suitable form of support usually upon one side of the type-carriage 3, as shown in Fig. 8, though its position may be considerably varied. Upon one end of this rock-shaft is a lever-arm 25 which is pivotally connected to one end of the plunger, the latter being arranged in a channel or groove in the forward end of the type-carriage. At its other end this shaft is provided with a lever-arm 26, which has engagement at its extremity, with a slot 27, formed in a plate or rigid strip 28, extending from one end of the machine to the other, and being coextensive with the line movement of the type-carriage. This strip, which is shown in Figs. 2 and 5, forms part of a frame having end-pieces or arms 29, (see Fig. 5) upon the forward ends of which said strip is rigidly mounted. These supporting arms are pivotally mounted near the rear of the machine upon studs 30 and the frame which is rigid is normally raised or turned upon its pivotal supports by a leaf-spring 31, the ends of which lie beneath lugs 32 formed or mounted upon the inner faces of the arms 29 of the frame. This spring is flexed upwardly and at or near its center has support upon a bracket 33 (Fig. 2), rigidly mounted upon the rear of the housing and projecting toward the front. Upon the side-arms or ends 29 of the same frame are upwardly-projecting bars 34, their upper ends united by horizontal bar 35,

which lies between the pivotal supports 30 and the forward ends of said arm rising to such a height that the horizontal bar 35 lies directly beneath the key-levers, which are constructed to act upon the horizontal bar 35 at each type-impression, and depress the frame carrying the channeled plate 28 and throw the latter downward as each key-lever is operated. This movement rocks the shaft 24 by means of the crank arm 26 having its end lying and traveling in the channel 27, thereby throwing the crank-arm 25 at the other end of the rock-shaft downward and operating the plunger 17 to rectify the type-disk as to its position and make the type-impression. The frame carrying the channel plate 28 is raised immediately after each stroke of a key-lever by the spring 31, thereby returning all the parts referred to to their normal position and lifting the plunger 17 just far enough to enable its point to clear the fringe of projections 17^a upon the type-disk and remove all obstruction to the partial rotation of said disk for a new type-selection.

The key-levers 19 are all of similar form, each being provided with a single slot 20, to engage the selection bar 18 and lock the same during the further downward movement of the type-lever struck by which the type-impression is made. All the key-levers are fulcrumed at their rear ends upon a horizontal fulcrum-support 38, extending from end to end of the housing. The connection of these key-levers with the fulcrum 38 is detachable in form said levers having simply notches upon their upper edges at or near their rear ends and held in engagement with the fulcrum by means of springs 40 of any suitable character, such for example as those shown in Figs. 2 and 5 of the drawings. These springs are independently soldered upon a horizontal support 41, extending from end to end of the machine above the key levers, and from this support the springs extend toward the rear and are turned downward, their ends being bent or provided with any suitable form of terminal 42 which will engage with the lower edges of the key-levers 19 in front of their fulcrum-support, and normally raise said levers until they are arrested by the horizontal support 41. Upon each key-lever is formed a downwardly projecting portion 43 of such form as to increase the width of the type-lever at a point lying beneath the horizontal support and projecting in front thereof, its forward extension being sufficiently extended to overlie the horizontal bar 35, which forms part of the frame including the channel-bar 28. By this arrangement, as each key-lever is struck the projection 43 upon the lever makes impact upon the horizontal bar 35, carrying the frame, of which the channeled plate 28 forms part, downward, and operating the plunger 17, this movement being exactly the same for each key-lever. To guide and support these key-levers, which are formed of flat plates of metal and which have

no positive connection with an axis or fulcrum, the springs 40 are extended from the point of their rigid attachment to the horizontal plate 41 downward far enough to include the widened portions of the type-levers formed by the extensions 43. These downward extensions lying upon each side of the key-levers give sufficient lateral support to prevent any twist or turn of the lever due to the resistance of the horizontal bar 35, by which the impressing plunger 17 is operated.

The feed of the type-carriage is effected by means of two independent and preferably double ratchet plates 44 and 45, extending horizontally nearly from end to end of the machine, and preferably arranged over the type-carriage, one of these ratchet-plates being rigidly fixed and the other being movable longitudinally. The rigid plate, as shown in the drawings, is the lower, the movable plate being shown in this arrangement as placed upon or above the rigid member. It should be noted, however, that this arrangement is in no sense necessary, as I may arrange these ratchet plates in the same plane or at points remote from each other. This arrangement is such that the type-carriage moves beneath the rigid plate, which I have designated by the numeral 45, and close enough to the ratchet plates to permit the engagement with its teeth of a pawl (or pawls) 46, which is pivotally mounted upon the type-carriage and held by a spring with its nose in engagement with the teeth of said ratchet plate. The movable plate I prefer to place upon the rigid member, or immediately above it, its teeth being formed with substantially the same pitch, and engaging with an independently-acting pawl or pawls 47, also pivoted upon the type-carriage and for convenience upon the same pivotal axis with the pawl or pawls 46, its mesh with the teeth of the movable ratchet plates being effected by an independent spring 48. The feed of the type-carriage is made by the reciprocation of the movable ratchet plate 44, this movement being produced at each action of each one of the key-levers during the recovery or return of said lever to its normal position. I prefer to effect the positive movement of said ratchet plate 44 by means of a vibrating arm 49 forming part of a rock-shaft 50, which is supported in any kind of suitable bearings upon one of the interior end-faces of the housing. These bearings for said rock-shaft usually form part of two horizontal plates 51 extending from end to end of the machine and forming supports or guides for the type-carriage in order to give accurate lineal feed movement and I utilize these guide-strips as a convenient support for the rock-shaft 50, the rearward end of which is bent toward the opposite end of the housing 3, thus forming a lever-arm upon said rock-shaft. The end of this lever-arm engages with a slot 52, formed in a bracket just in rear of the channeled plate 28 (Fig. 5) and at a little distance from the arm 29 at the operator's right

hand end of the machine. The movement of the plate 28, by the action of any one of the key-levers upon the bar 35, will throw the channeled plate 28 downward, carrying with it the bracket containing the slot 52 in which lies the end of the lever-arm on the rock-shaft 50. Said shaft is thereby rocked and a vibrating movement in one direction is communicated to the arm 49 extending upwardly from said rock-shaft. The extremity of this arm 49 engages with the movable ratchet-plate 44, which is moved to the left of the operator the distance of one tooth, or thereabout. During this movement the pawl or pawls 46, meshing with the ratchet-plate 45, prevent any movement of the type-carriage. As the operator releases the key-lever, the latter instantly rises, and the pressure upon the bar 35 being removed, the spring 31 lifts the arm 29 and plate 28, together with the bracket carrying the end of the lever-arm on the rock-shaft 50, whereby a reverse rocking movement is given the latter and the arm 49 is vibrated toward the right hand, carrying the movable ratchet-plate 44 toward the right-hand. As the pawl or pawls, 47 are meshed with the teeth of the said ratchet-plate, the type-carriage is compelled to move with the latter the distance of one tooth toward the right-hand, and at the end of said movement the pawl or pawls 46, which move with said carriage and ride over the toothed edge of the fixed ratchet-plate 45, make a new engagement with said edge and hold the carriage securely against the slightest retrograde movement.

The vibration of the channeled plate 28, while it effects the feed movement of the type-carriage to give the letter-space, also acts upon the lever-arm 26, the end of which travels in the channel or slot 27 in said plate 28, and thereby operates the plunger 17, making a single type-impression by the downward movement of the plate 28, while the type-carriage is stationary, and lifting the plunger 17 and permitting the type-disk to resume its normal position as the plate 28 rises and the type-carriage is fed forward.

To form the word-space the spacing-bar 56 is depressed the right-hand end of bar being suspended from a pivotal support 54 by means of a hanger 55. The pivotal support 54 is upon the end of a lever 53, fulcrumed upon the right-hand end of the casing upon a support 53^a (Figs. 2 and 4). The inner or rearward end of said lever is curved toward the left (Fig. 4) and downward (Fig. 5) and its notched end is brought just in rear of the plate 28 and between the slot 52 and the end bar 29. The notch in the end of said lever 53 engages the lever arm on the rock-shaft 50. Thus, a downward pressure on the spacing-bar 56, causes an upward movement of the lever-arm on rock-shaft 50 whereby the type-carriage is moved, simultaneously with said action of the spacing-bar, toward the operator's right-hand a distance substantially

equivalent to the interval between the adjacent teeth upon the ratchet-plate. At the termination of this movement the pawl or pawls 46 make engagement with a farther tooth upon the fixed ratchet-plate 45 and lock the type-carriage in its advanced position. When the spacing-bar 56 is released it is returned to normal position, together with the lever 53, rock-shaft 50 and ratchet-plate 44, by the agency of any suitable spring. This movement of the space-bar 56 does not produce action of the channeled plate 28. Moreover, the word-space is produced by a movement of the ratchet-plate 44 to the right which is simultaneous with the depression of said space-bar, whereas the letter-space is produced by the movements of the ratchet-plate 44, the first being to the left and the second to the right, the letter-space feed being produced by the latter movement.

I prefer, in all cases, to make each ratchet-plate 44 and 45 of duplex form. In that portion of this specification immediately preceding, I have referred to the pawls 46 and 47, which mesh with the fixed and the movable ratchet-plates 44 and 45, respectively, as being present either as single elements, or in plurality.

While my invention comprises the broad idea including the former arrangement, it is a feature of much importance that it also includes the more limited feature of duplex ratchet-plates, each having two intermeshing pawls, or four in the aggregate. I have shown in the drawings, therefore, the duplex form of ratchet-plate, in which each ratchet consists of two parallel, similarly toothed members, one of which is arranged at or near the front of the type-carriage, and the other member at or near the rear of the same, the object being to not only feed both the front and the rear end of the type-carriage simultaneously and equally, but to hold both of said ends positively and equally. By this double, or duplex construction of the ratchet-plates and by the corresponding duplication of the pawls, and the mechanical arrangements of parts set forth, I am able to obtain perfect alignment, to effect the letter-space and word-space feed in the minimum time, without the slightest interference with the automatic restoration to place of the type-disk and segment-gear and without the slightest impediment to the maximum speed of operation. Moreover, by means of this part of my invention I am able to materially reduce the number of elemental parts, to simplify their construction and arrangement, to effect an important economy in the first cost of the machine, and to avoid, in a great measure, if not entirely, the previous inaccuracies in alignment and space-feed which have been heretofore encountered when type-writing machines have been permitted to become foul with dust and various accumulations of foreign matter.

The type-selections for both upper and lower

case letters are effected by the key-levers acting for both selections upon the selection-bar in the same direction of movement. In other words, by referring to Fig. 2, it will be seen that the key-levers in all cases swing the selection bar toward the front of the machine. As the type are arranged upon the type-disk 15, the lower case letters are in one series upon one part of said disk and the upper case or capital letters are upon another part or upon the opposite side of the axis of the disk. Economy of movement makes it desirable that in shifting from one class of letters to the other a rotation should be given to the type-disk in the one case in a direction opposite to that imparted in making the type-selections for the other class of letters. To make this shift from one series to the other series, it is desirable to have the simplest possible arrangement, the minimum number of parts and an action of the shifting device of the briefest and simplest kind. To accomplish this, therefore, I reverse the rotation of the vertical shaft 4, which carries the type-disk, by a simple clutch, which has been already referred to.

The driving bevel-gear 10 is in mesh with both the bevel gears 5 and 6, upon the opposite ends of the vertical shaft 4 and said shaft is turned in one direction or the other, according to the engagement of the clutch with the upper bevel gear 5, or the lower bevel-gear 6. When either one of these bevel-gears is locked to the shaft 4 by said clutch, the other bevel-gear turns loosely upon said shaft in the opposite direction. The clutch is thrown by means of a shifting lever 70, fulcrumed upon one end of the housing 3 and provided with a downwardly curved arm 71, which is connected by a bar or arm 72 with the forked end 9 of the clutch-lever 8. This bar or arm 72 extends to the opposite side of the machine, its end connecting with a curved arm similar to the curved arm 71, and having a support at or near the rear of the machine casing. The shifting lever 70 is raised into normal position for lower case letters and is held in said position by means of a spring engaging with a pin 74 upon its side. The action of these parts is so obvious that no description is necessary.

The ink-ribbon 74^a is stretched and held by means of a ribbon-stretching frame 75, the parallel arms of which lie close to the end-walls of the housing. The ends of the ribbon are held in the arms by a simple latch 76, pivotally attached to each of said arms and swinging over the same to confine the end of the ribbon which is drawn around the end of the stretching arm. In order that a new ink-surface may be presented at the end of each line of type-impression I feed the ink-ribbon a distance equal to the height of the type as the carriage reaches either end of the line. This is done by simply connecting the stretching arms 75 at their rearward ends by a rigid bar 77, shown in detail in Fig. 3, and

I give an automatic feed-movement to the three-part frame, by the following means: Upon a suitable support 80, mounted upon the bracket 33 is journaled a disk 81 of any suitable diameter having upon one of its faces a series of ratchet teeth 83 and connected with a lever 84, which has a loose pivotal connection with the axis of the disk. The free end of this lever is provided with a fork 85 projecting toward the front and lying normally in the path of a stud 86 which depends from the rear end of the type-carriage. Loose upon the axis 80 of the disk 81, and connected with a slot in the lever 84 by a pin 84^a is a pawl 87, which has positive engagement with the ratchet teeth 83 as the lever swings in one direction, but passes lightly over the same while moving in the opposite direction. As the type-carriage moves toward one end of the line in printing, the stud 86 engages the fork and carries the lever with it through a small arc of the disk, there leaving it; but in returning to the position for the beginning of a new line, the same stud engages the lever and swings it in the other direction and turns the disk 81 with it, and thereby operating a cam 88 which acts upon a slotted slide-bar 89, and thereby throws the ink-stretching frame a short distance in one direction or the other, transversely to the line of movement of the carriage. The same movement may, evidently, be accomplished by a link motion or by any of the known equivalents of the cam or link-lever.

I propose to provide means for the automatic return of the type-carriage after the completion of each line by the traction of any preferred form of spring. As this movement requires but a comparatively slight force a light coil spring such as that shown in Fig. 2 by the reference numeral 113, will render the movement automatic. Said spring is coiled upon the right-hand side of the housing 3 of the type-carriage and fastened at its end to any suitable support, such as that shown at 114. A release bar 92 is mounted directly in the rear of the space-bar, supported upon studs 93, which project from the front of the housing and which lie in inclined slots 94 near the ends of the release bar. The releasing bar 92 is straight along its lower edge or bottom, and is held in normal position by a spring 93^a (Figs. 2 and 5). When it is desired to return the type-carriage toward the operator's left hand, the releasing bar 92 is pressed downward, against the lug 69^a of the rock-shaft 69. The rocking movement of the latter throws all the pawls on the type-carriage out of engagement with the ratchet-plates 44 and 45. Upon the rock-shaft 69 are arms 69^b the ends of which bear (Figs. 1, 2 and 8), against the heels of the pawls 46 and 47, and by pressure draw the noses of said pawls out of mesh with the ratchet-plates. The spring 113 then returns the type-carriage to the left side of the machine.

In order to enable the operator to return the type-carriage by hand, after the completion of a line, the rock-shaft 69 is provided with an arm 69^a which is brought along the front of the housing 3, as in Fig. 8, and provided with an outwardly projecting lug, or foot 69^b, on the extremity of a downwardly bent portion of the arm. By pressing this foot down the rock-shaft 69 with arms 46^a releases the dogs from contact with ratchet-plates 44 and 45 and then the carriage can be placed wherever desired.

The machine may be used either upon a detachable base 100, having two paper feed-rolls 101 and 102, operated for line space by any suitable means, or it may be placed bodily, after the removal of the base, between the parallel bars 103 of the leaf-holder, adapted to confine the pages of a ledger or record book of any size, to hold the same flat and to guide the type-writer which is moved bodily between these bars to give the line space. In this case no feed devices are necessary, as the feed must be varied upon different books, but as the operator may desire some guide, notches 104 may be formed in the inner edges of these bars to indicate equal line spaces. These parallel bars 103 are connected by a rigid strip 105, and have connection to a lower parallel pair of bars 106, by means of linked plates 107, so hinged as to give parallel movement to the bars 103, toward or from the lower bars 106. The latter are connected at one end by a rigid bar 108, and adjustment to a limited extent is given by means of slots 109 in the bars 106 at one end to accommodate the device to different lengths of book. Slots 110 are formed in the other ends and brackets 112 are mounted upon the lower bars to move in these slots and afford a firm hold upon the ends of the book. As I use one of these leaf-holders upon each side of the book they will have independent adjustment and may be contracted to confine any number of pages, be the same more or less, holding them perfectly flat as the type-writer moves between the parallel bars 103.

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

1. In a type-writer, the combination with a movable type-carriage, of two independent ratchet-plates, one rigid the other movable, two spring-pressed pawls having independent action and engaging said ratchet-plates and means for operating the movable ratchet, substantially as specified.

2. In a type-writer, the combination with a movable type-carriage of two independent ratchet-plates, one movable the other rigid, two spring-pressed pawls, having independent action, a reciprocating frame, vibrated by the key-levers and a connection between said frame and the movable ratchet-plate substantially as specified.

3. In a type-writer, the combination with

- the movable type carriage, of a type-disk, a system of gears, a segment gear, a selection-bar, substantially parallel with the line of movement of the carriage, and a series of key-levers acting upon the selection-bar to give differential movement thereto, substantially as specified.
4. In a type-writer, the combination, with a movable type-carriage, of a type-disk, a system of gears, a segment gear, a selection-bar parallel or substantially so with the line of movement of the type-carriage, and a series of similar key levers having slots to receive the selection-bar and having such arrangement that the cam-edges adjacent to said slots upon one side shall have a differential range of action upon the selection-bar, substantially as specified.
5. In a type-writer, the combination, with a movable type-carriage, of a type-disk, a system of gears, a segment gear, a selection-bar parallel, or substantially so with the line of movement of the type-carriage, and having arms at its ends pivoted in rigid supports, and a series of similar key-levers having slots which receive the selection-bar at its different limits of movement and provided with cam edges having differential action upon said selection-bar, substantially as specified.
6. In a type-writer, the combination, with a movable type-carriage, of a fixed ratchet-plate, a movable ratchet-plate, independently-acting pawls automatically meshed with said ratchet-plates, a series of key-levers, and means intermediate of said levers and the movable ratchet-plate, whereby movement is given intermittently to the latter in a line parallel with the line of movement of the type-carriage, substantially as specified.
7. In a type-writer, an inking-ribbon, a stretching frame, to which the ends of said ribbon are clamped, and automatic means for giving an intermittent movement to said ribbon-stretching frame to expose a different longitudinal portion thereof to the line of type-impressions said movement being imparted at one end of the line, substantially as specified.
8. In a type-writer, an inking-ribbon, a ribbon-stretching frame to which the ends of said ribbon are clamped, automatic means for giving an intermittent feed-movement to said ribbon-stretching frame at one end of the line of type-impressions and at an angle to said line, a movable type-carriage carrying a series of type and means for impressing said type upon the inking-ribbon and paper, substantially as specified.
9. In a type-writer, a movable type-carriage, a rotary type-disk upon said carriage, a system of gears imparting rotary movement to the type-disk, means for imparting differential rotary movement to said gears, and a clutch to lock one or the other of two gears to the shaft of the type-disk, substantially as specified.
10. In a type-writer, the combination with a movable type-carriage, of a rotary type-disk, a single gear imparting rotation to said disk, and a clutch to lock either of two gears to the shaft of said disk, substantially as specified.
11. In a type-writer, the combination, with a movable type-carriage, of a type-disk mounted upon said carriage, a series of key-levers, an actuating-gear, a single segment-gear having a gear-face of a width substantially equal to the length of the line of movement of the type-carriage, said segment-gear being intermediate between said key-levers and the actuating-gear, a clutch and clutch-lever and two opposite bevel-gears meshing with the actuating-gear and loose upon the shaft of said type-disk on opposite sides of the axis of the actuating-gear, substantially as specified.
12. In a type-writer, the combination, with a type-impressing mechanism capable of bodily movement, of a page-holder composed of two upper and two lower bars rigidly connected in parallelism, the upper members being united to the lower by hinged connections to give a parallel adjustment in either direction without longitudinal movement, substantially as specified.
13. In a type-writer, the combination with a movable type-carriage, of two independent ratchet plates one movable and the other fixed, or rigid, each having two separate, parallel toothed members, one arranged in or near the front and the other in or near the rear of the said type-carriage, independent pawls engaging said toothed members and means for operating the movable ratchet-plate, substantially as described.
14. In a type-writer, the combination with a movable type-carriage of two independent ratchet-plates, one movable and the other fixed or rigid, each of said ratchet-plates consisting of two parallel toothed portions, or members, one of which lies in front and the other in rear of the central line of said type-carriage four independent, spring-pressed pawls pivoted upon the type-carriage and meshing with said ratchet-plates, a device vibrated by the depression of any one of the key-levers, and a connection between said device and the movable ratchet-plate, substantially as described.
- In testimony whereof I affix my signature in presence of two witnesses.
- JOHN JACKSON.
- Witnesses:
WM. A. EASTERDAY,
CHAS. B. TILDEN.