No. 647,375. Patented Apr. 10, 1900.

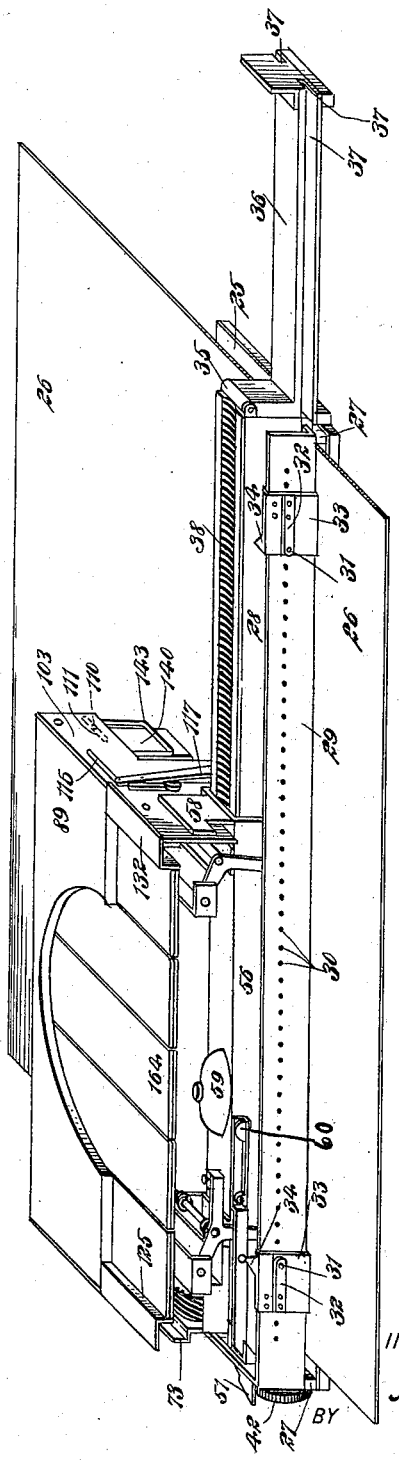
M. S. CARMONA.

TYPE WRITER.

(Application filed May 15, 1899.)

(No Model.) 6 Sheets—Sheet 1.

FIG 1



WITNESSES:
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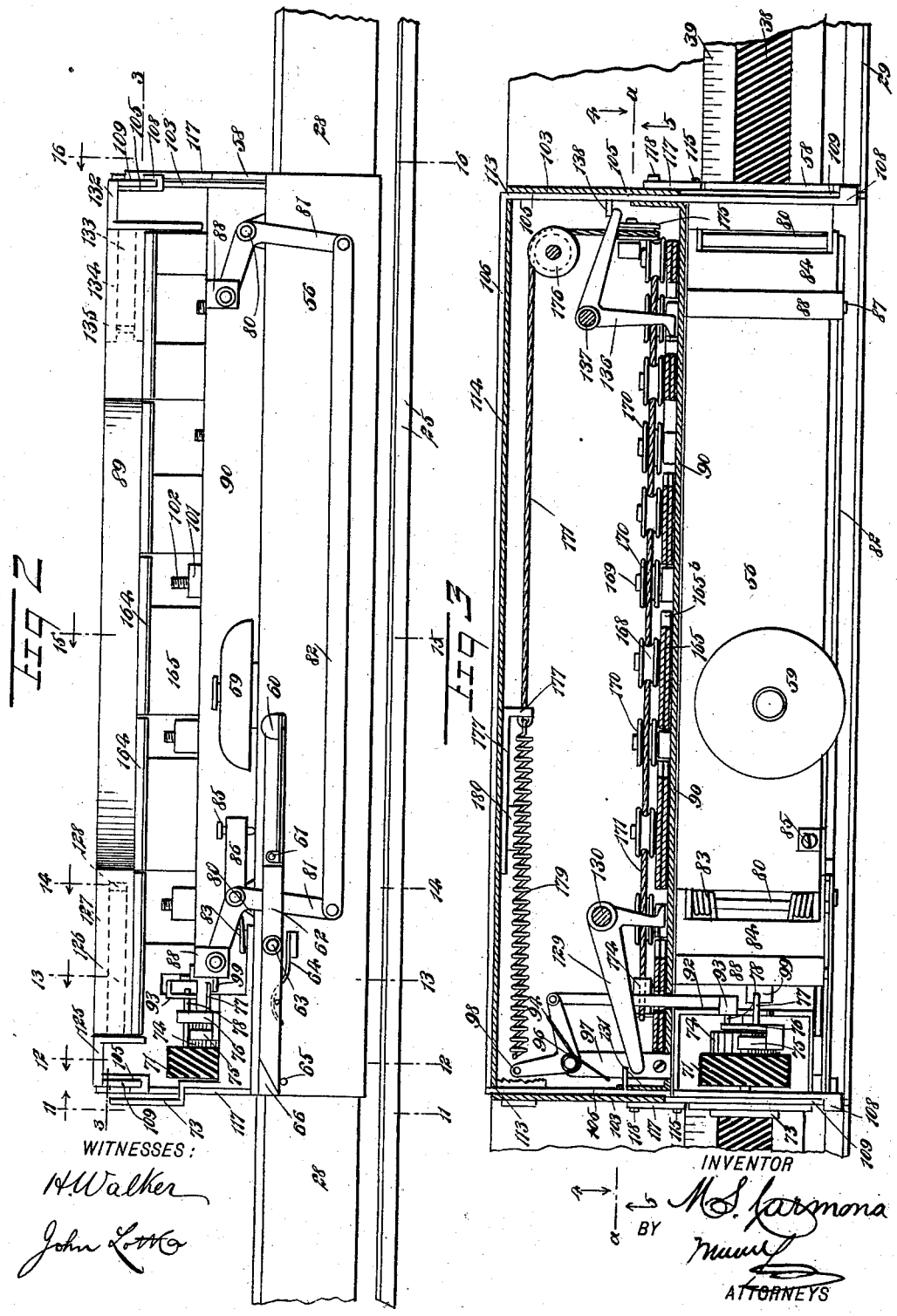
(No Model.) 6 Sheets—Sheet 2.



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(No Model.) 6 Sheets—Sheet 3.

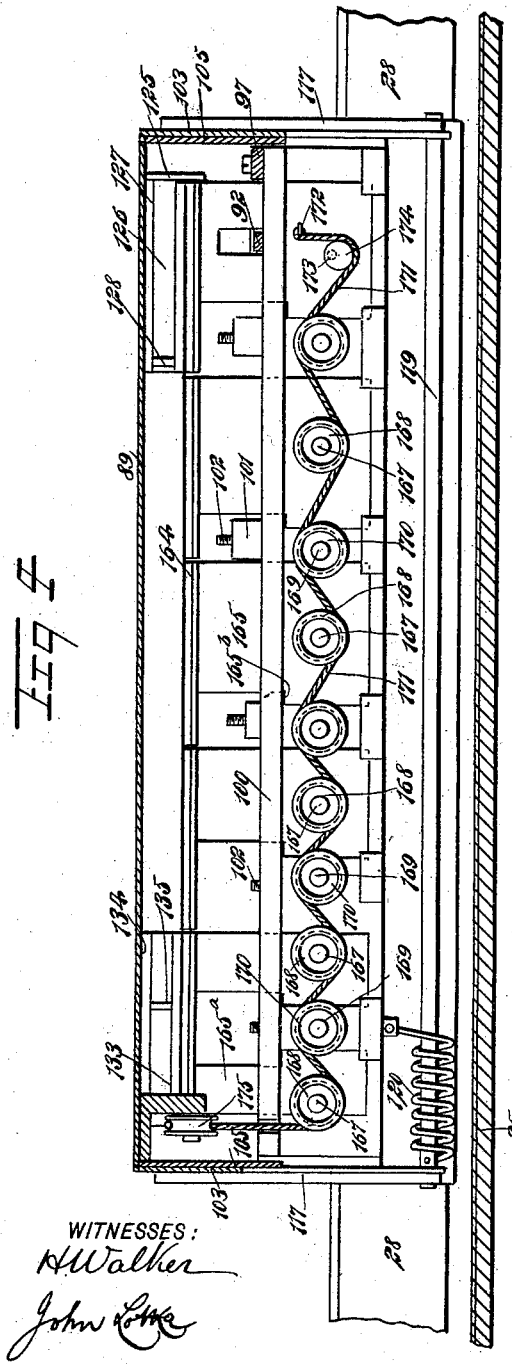

Fig 4

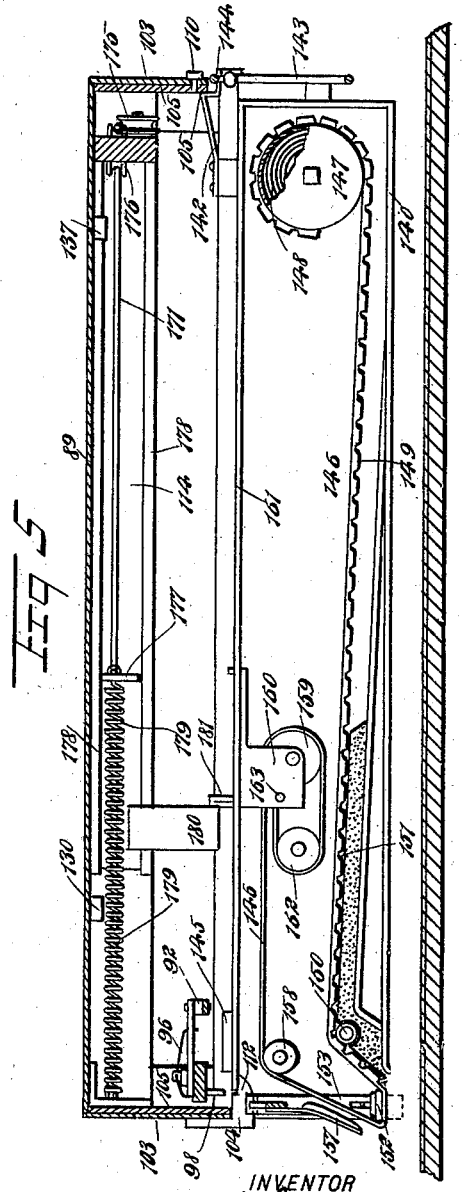

Fig 5

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(No Model.) (Application filed May 15, 1899.)

6 Sheets—Sheet 4.

Fig 6

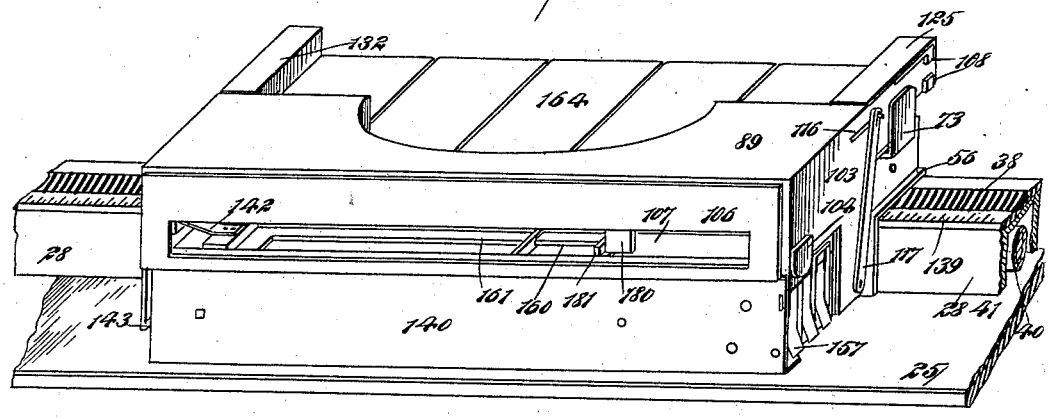


Fig 7

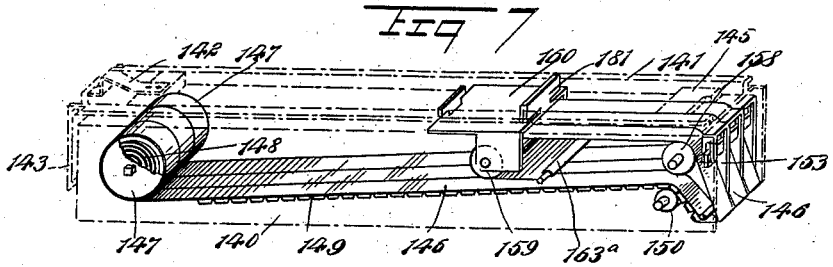


Fig 8

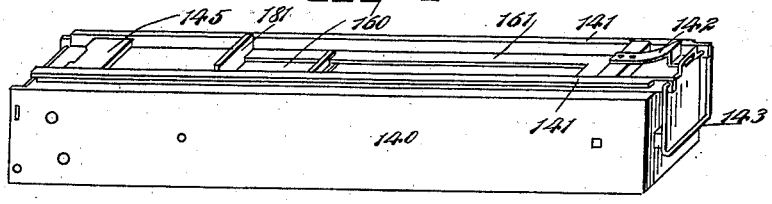


Fig 9

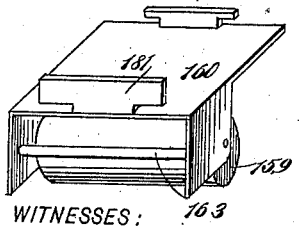


Fig 10

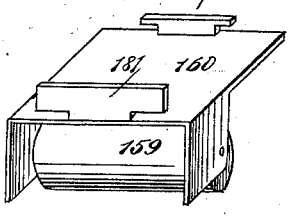
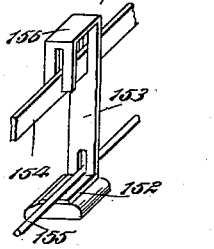


Fig 10a



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(No Model.) 6 Sheets—Sheet 5.

Fig 11

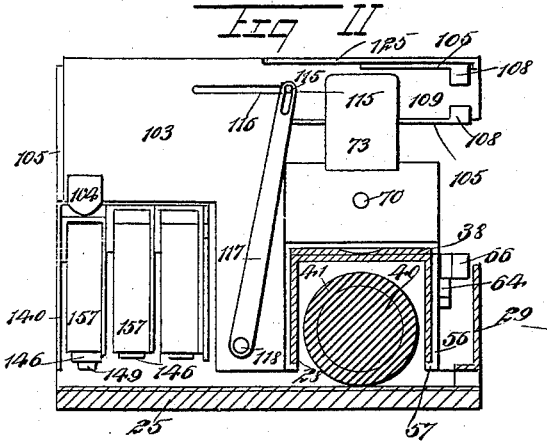


Fig 12

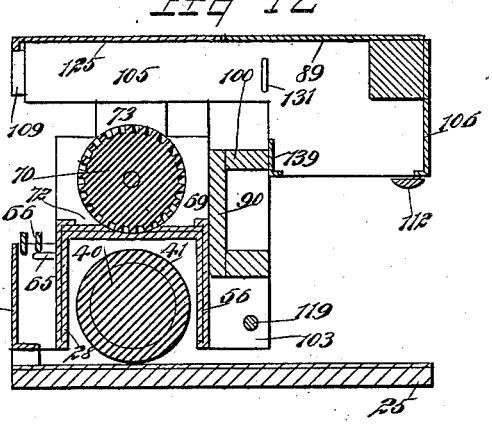


Fig 13

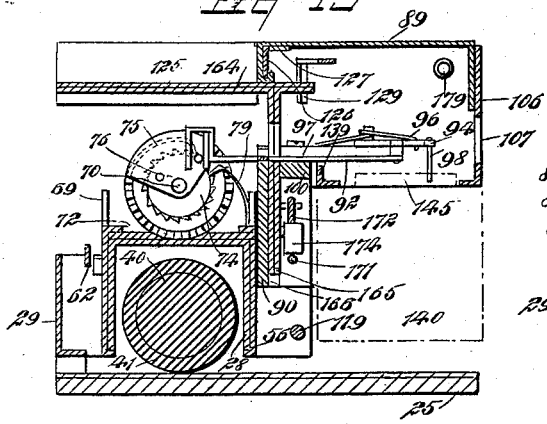


Fig 14

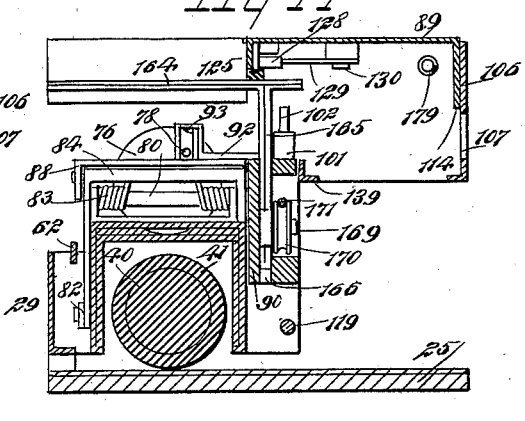


Fig 15

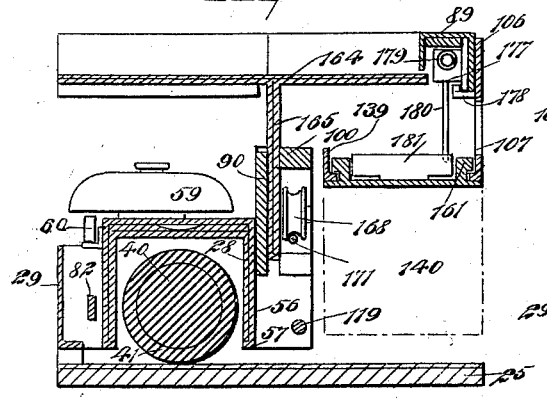
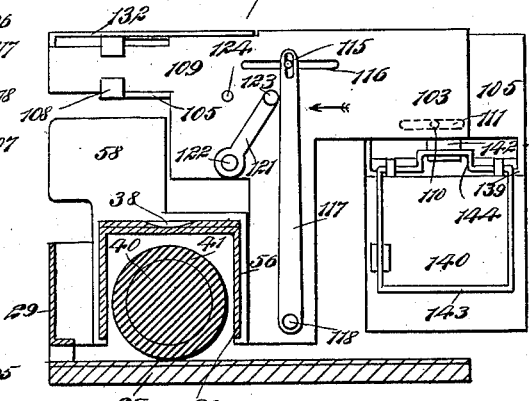


Fig 16



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TYPE WRITER.

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(No Model.) 6 Sheets—Sheet 6.

Fig 17

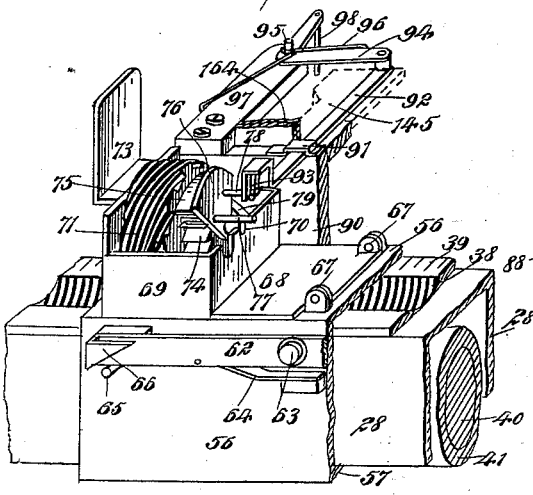


Fig 18

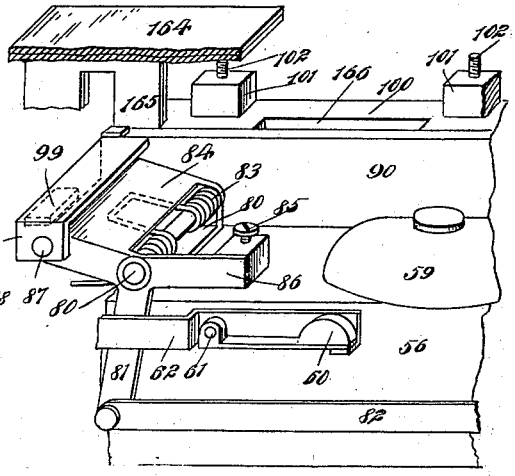


Fig 19

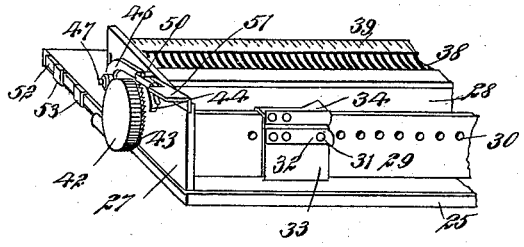


Fig 20

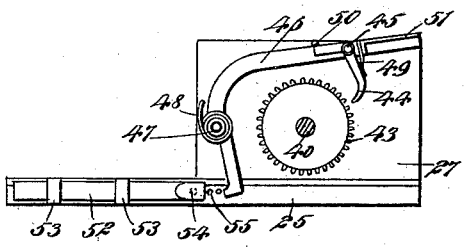
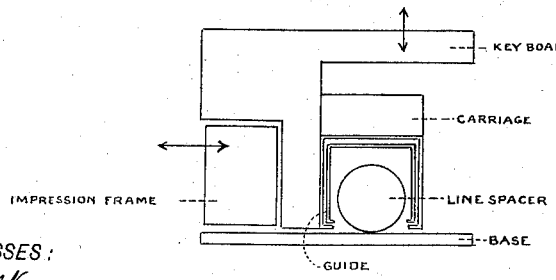


Fig 21



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ATTORNEYS

UNITED STATES PATENT OFFICE.

MANUEL S. CARMONA, OF MEXICO, MEXICO.

TYPE-WRITER.

SPECIFICATION forming part of Letters Patent No. 647,375, dated April 10, 1900.

Application filed May 15, 1899. Serial No. 716,835. (No model.)

To all whom it may concern:

Be it known that I, MANUEL S. CARMONA, a citizen of the Republic of Mexico, and a resident of the city of Mexico, Mexico, have invented new and useful Improvements in Type-Writers, of which the following is a full, clear, and exact description.

My invention relates to that class of type-writers in which only a small number of keys—for instance, five—are employed, which are operated either singly or in various combinations to enable a comparatively large number of characters or signs to be written—for instance, thirty-one or thirty-two with five keys, or a multiple of thirty-two if two or more series of type are provided.

The general principles on which my type-writer is based are fully explained in my application for United States patent, Serial No. 669,151, filed February 4, 1898.

The object of my present invention is to simplify and lighten the construction.

To this end my invention consists in certain features of construction and combinations of the same, as will be fully described hereinafter and specifically pointed out in the appended claims.

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

Figure 1 is a perspective view of the improved machine. Fig. 2 is a front elevation thereof with parts broken away. Fig. 3 is a plan view with parts in section substantially on the line 3 3 of Fig. 2. Figs. 4 and 5 are sectional elevations on the line *a a* of Fig. 3 looking, respectively, in the direction of the arrows 4 4 and 5 5. Fig. 6 is a rear elevation of the machine in perspective. Fig. 7 is a detail perspective view of the type-bands and the parts connected therewith. Fig. 8 is a perspective view of the case containing the type-bands. Figs. 9 and 10 are details of two forms of carriage for the ends of the type-bands. Fig. 10[a] is a detail of the mechanism for throwing the type into the printing position. Figs. 11 to 16 are cross-sections taken on the corresponding lines 11 11 to 16 16 of Fig. 2. Figs. 17 and 18 and 19 and 20 are details of the carriage-feed mechanism and line-spacer, respectively; and Fig. 21 is a diagrammatic end view of the principal parts of the machine.

The improved type-writer is constructed to travel bodily, the paper or other writing-surface remaining stationary. The reverse arrangement, however, might be employed with a very slight and obvious change of construction.

The machine comprises the following main parts, viz., (see the diagram Fig. 21:) The stationary base or guide having a line-spacer for feeding the paper after a line has been written; a carriage arranged to travel on said guide and provided with a feed device; a keyboard-frame movable vertically—that is, toward and from the writing-surface—and supported on the carriage, said frame operating the carriage-feed mechanism; an impression-frame mounted on the keyboard-frame so as to partake of its vertical movement, but capable, besides, of an independent transverse movement; a type-box containing type-bands and carried by the impression-frame, and keys carried by the keyboard-frame and controlling the position of the type. I will now specifically describe these several parts in the order named.

The base or guide.—The base-plate 25, Fig. 1, is adapted to support the paper 26, and from the ends of said plate rise standards 27, which carry the hollow inverted-U-shaped guide-bar 28. To the standards 27 is also secured, so as to extend at a distance in front of the guide 28 and parallel therewith, a plate 29, having perforations 30, adapted to be engaged by pins 31 at the ends of springs 32, secured to slides 33, which may be moved longitudinally of the plate 29 and carry projections 34 to operate a bell to indicate where the writing should begin and end, as will be described presently. To one end of the guide-bar 28 is hinged, near the upper end, as indicated at 35, an extension 36, having guide-grooves 37 and adapted to be folded over one-half of the guide-bar 28, or that part of it which is not occupied by the carriage when the latter is at the opposite end of the guide 28 to the hinge 35. The guide-bar 28 has a recess on its upper face, in which is cut a screw-thread or rack 38. To enable the carriage to be located exactly, the guide-bar 28

may be provided at one edge with a graduation 39, as indicated in Figs. 17 and 19. The purpose of the extension 36 is to enable the carriage to travel beyond the right-hand end of the paper 26, this being necessary for the reason that the impression-point is at the left-hand end of the carriage. The extension 36 is hinged to allow it to be folded over the guide-bar 28, as described, so as to bring the machine into a very compact shape when not in use.

The line-spacer.—To feed the paper 26 after the impression of a line, I journal within the hollow of the guide-bar 28 a shaft 40, having a rubber cover 41, adapted to engage the paper. (See Figs. 11 to 17.) The shaft projects through one of the standards 27 at the opposite end to that at which the hinge 35 is arranged, and on said projecting end are secured a milled head 42 and a ratchet-wheel 43. Said wheel is adapted to be engaged by a pawl 44, fulcrumed at 45 on an arm 46, whose fulcrum is at 47 upon the said standard 27, the arm and pawl being held in their normal position by springs 48 and 49, respectively. The pawl 44 is normally out of engagement with the ratchet-wheel 43, so as to allow the rollers 40 41 to be turned freely. A stop 50 limits the upward movement of the arm 46, which has a handle 51 for manually depressing it. To regulate the throw of the arm 46, I employ a stop adjustable forwardly and rearwardly on the base 25 and consisting of a spring-arm 52, sliding in guides 53 and having a pin 54 to engage a series of perforations 55 on the base 25.

The carriage.—The carriage consists of a slide 56, U-shaped to fit on the guide-bar 28 and having inturned flanges 57 at its bottom to take under said guide-bar or into the grooves 37 of the extension 36 when the carriage travels to the right beyond the end of the guide-bar 28. At one end of the slide 56 is a vertical plate 58. On the carriage is secured a bell 59, adapted to be struck by the hammer 60, (see Figs. 17 and 18,) pivoted at 61 to a lever 62, which is fulcrumed at 63 upon the slide 56, the lever and hammer being normally kept away from the bell by a spring 64, which also causes the hammer to strike the bell in the usual way. A stop 65 limits the movement of the lever 62, and at the end of the lever is a wedge-shaped projection 66, adapted to engage the projections 34 of the stationary slides 33 to ring the bell at the desired moment.

The carriage-feed mechanism.—At one end of the carriage are located hinges 67, to connect with the carriage a plate 68, carrying a box 69, in which is journaled a shaft 70. On this shaft is mounted a worm 71, arranged to project through an opening 72 in the slide 56 (see Figs. 12 and 13) and to engage the screw-thread 38 of the guide-bar 28. It will be obvious that a rotation of the worm 71 will cause the carriage to travel longitudinally of the guide 28. The pitch of the screw-thread is so selected as to lock the carriage against accidental lengthwise movement. To enable the carriage to be shifted freely along the guide-bar 28, the worm 71 may be lifted out of engagement with the screw-thread or rack 38, a handle 73 being for this purpose attached to the box 69. This handle corresponds in location to the guide-plate 58 at the other end of the carriage, so that the operator may rest the little finger against the plate 58 and the thumb against the handle 73 when it is desired to lift the worm 71. To rotate the worm 71 intermittently, I provide the following mechanism. Rigid with the worm is a ratchet-wheel 74, adapted to be engaged and turned (in one direction only) by a pawl 75, secured to a sector 76, mounted on the shaft 70 loosely in relation to the worm 71 and ratchet-wheel 74, Figs. 13 and 17. The sector carries two pins 77 and 78, respectively, for turning it alternately in opposite directions, as will be described presently. A pawl 79, secured to the box 69, prevents movement of the ratchet-wheel 74 in one direction. It will be understood that when the sector 76 turns in one direction the worm 71 remains stationary, the pawl 75 slipping over the teeth of the ratchet-wheel 74. When the sector 76 turns in the opposite direction, the pawl 75 causes the ratchet-wheel 74 and the worm 71 to turn, thus feeding the carriage along the rack 38 or guide 28.

The keyboard-frame.—On the carriage-slide 56 are located brackets or bearings 80, in which are journaled bell-crank levers 81, connected by a longitudinal rod 82, so as to move in unison, and a spring 83, Figs. 2 and 18, engaging the top of the slide 56 and a plate 84, which is rigid with one of the levers 81, keeps the levers normally in an elevated position. To regulate this normal position, an adjusting-screw 85 is passed through an extension 86 on one of the levers 81 to engage the top of the slide 56. The levers 81 are pivotally connected at their upper ends, as indicated at 87, with lugs 88 secured to the keyboard-frame proper. This frame has an approximately-horizontal top 89, which extends over the rear part of the machine, Figs. 13 and 14, and a vertical portion 90, which moves along the vertical rear wall of the slide 56. At one end of said vertical portion 90, Fig. 17, is located a guide 91, in which is adapted to slide an arm 92, having a forked end 93, which fits over the pin 78 of the sector 76. The arm 92 is pivotally connected with the lever 94, fulcrumed at 95 and constantly pressed in one direction by a spring 96, which also engages an arm 97, rigid with the portion 90 of the keyboard-frame. At its free end the lever 94 carries a pin 98 for limiting the movement of the arm 92 by coming in engagement with a stop, as will be fully described hereinafter. The lug 88 of the keyboard-frame has a projection 99, Fig. 18, which takes under the pin 77 of the sector 76, and therefore has a tendency to turn said sec-

tor against the tension of the spring 96. The spring 83 is made strong enough to overcome the spring 96 and the weight of the keyboard-frame and of the parts carried thereby. A horizontal member 100, forming part of the keyboard-frame, carries at intervals lugs 101 and pins 102, which may be in the nature of screws to allow them to be readily adjusted, Figs. 2, 4, and 18. The pins 102 project to different heights, as shown, for a purpose that will be stated in the detailed description of the keyboard. The keyboard-frame has end plates 103, one of which carries a rounded projection 104. (See Figs. 5, 6, and 11.)

The impression-frame.—Between the end walls 103 of the keyboard-frame are adapted to slide the parallel end walls 105 of the impression-frame connected by a longitudinal wall 106, in which is an aperture 107, through which certain parts of the mechanism may be observed. The impression-frame is guided on the keyboard-frame, first, by lugs 108, which clasp a reduced portion 109 of the ends 103; second, at one end by a pin 110, secured to one of the end walls 103 and engaging a horizontal slot 111 in one of the walls 105; third, at the other end by resting on the top of an inward extension 112 of the projection 104; fourth, by passing through slots 113, formed at the ends of the rear wall 114, depending from the top 89 of the keyboard-frame, and, fifth, by pins 115, projecting from each end 105 of the impression-frame through slots 116 in the end walls 103. These pins engage the slotted ends of links 117, fulcrumed at 118 on the end walls 103 of the keyboard-frame. The links are connected by a shaft 119, on which is coiled a spring 120, having a tendency to press the impression-frame in the direction indicated by the arrow in Fig. 16. To cause the frame to return only to its central position under the influence of the spring 120, when it is desired to so limit its movement, I provide a lever 121, fulcrumed at 122 on one of the walls 103 and made of elastic material, with its end 123 adapted to be sprung into one of two apertures 124, the lever in one position limiting the movement of the frame, as above indicated, while in the other position the lever is out of action.

The mechanism for moving the impression-frame, (against the spring 120.)—It will be understood that the spring 120 returns the impression-frame to the extreme position shown in Figs. 1 and 11 or when the lever 121 is in the position shown in Fig. 16 to the central position shown in said figure. In order to move the impression-frame into the extreme position opposite to that shown in Figs. 1 and 11, I provide a key 125, having an arm 126, movable laterally—that is, parallel with the guide 28—in a guide 127, secured to the under side of the top plate 89 of the keyboard-frame. At its inner end said arm 126 carries a projection 128, engaged by one end of a bell-crank lever 129, fulcrumed at 130 below the top 89. The other arm of the lever 129 engages a projection 131 on the inside of one of the end walls 105 of the impression-frame. It will be obvious that by pressing the key 125 laterally outward the operator will move the impression-frame rearward until the pins 115 reach the end of the slots 116. At the other end of the keyboard-frame is located another outwardly-movable key 132, having an arm 133, sliding in a guide 134, and a projection 135, engaged by one end of a lever 136, fulcrumed at 137 on the under side of the top 89. The lever engages a projection 138 on the other end wall 105 of the impression-frame and is constructed substantially like the other lever 129, except that the fulcrum is located differently, so that an outward movement of the key 132 will move the impression-frame only half-way—that is, to its central position.

The type-box.—The impression-frame has longitudinal ledges or guides 139, Figs. 12 to 16, on which is adapted to slide the type-box 140, having angular flanges 141 for engaging said guides. (See also Figs. 7 and 8.) The movement of the type-box is limited at one end by the extension 112 of the projection 104, Fig. 5. At the other end the type-box has a spring-catch 142, adapted to spring behind one of the end walls 105 of the impression-frame, and a handle 143 for manipulating the type-box, the handle having a crank portion 144 for throwing the spring-catch 142 out of engagement with the impression-frame, so as to allow the type-box to be withdrawn. At the opposite end the type-box has a projection or stop 145, the edge of which may be straight or stepped, as shown, for a purpose stated hereinafter. This stop is in the path of travel of the pin 98, Fig. 17. The type-box is open at the top and at one end, where the type is in the printing position.

The type-bands.—The type-bands 146 are three in number, being arranged side by side in the type-box 140. One end of each type-band is secured to an independent roller or barrel 147, journaled in said box 140 and controlled by a coiled spring 148, so as to keep the type-bands under tension. The bands 146 carry type 149 at regular intervals on their under sides. In the example shown each band carries thirty-one types. From the spring-barrels 147 the bands extend longitudinally of the type-box 140 to pass over guide-rollers 150 and an inking-pad 151. Then the bands pass out through the open end of the box 140 and under shoes 152, secured to the lower end of bars 153, Fig. 10[a], which are movable vertically on transverse guides 154 and 155, connecting the longitudinal walls of the type-box 140. These bars 153 are normally held in their upper position by the tension of the respective type-bands 146; but one of these bars is held down by the engagement of its horizontal top 156 with the projection 104 of the keyboard-frame, causing the corresponding type-band to project downwardly beyond its neighbors and beyond the bottom of the box 140, as indicated in dotted lines in Fig. 5. This is the print-

ing position of the type-band. Each type-band from its shoe 152 passes upward adjacent to another inking-pad 157, secured to the type-box, and over a roller 158, journaled in the type-box 140, to a roller 159, journaled in a carriage 160, Fig. 9, which travels on longitudinal guides 161 at the top of the type-box. After passing around the roller 159 the type-bands are led to a roller 162, journaled in the type-box 140, and finally the ends of the type-bands are fastened to a rod 163 on the carriage 160. (See Figs. 5 and 9.) It will be obvious that with this construction every movement of the carriage will produce a movement of the type-bands of threefold extent. In many cases a twofold amplification would be sufficient, and for this purpose I may simply suppress the bar 163 (see Fig. 10) and secure the ends of the type-bands 146 to a rod 163[a], secured to the type-box 140, as shown in Fig. 7. In any event when amplification is desired the type-bands 146 will have a plurality of runs at the carriage 160, two runs for a twofold amplification, as shown in Fig. 7, or three runs for a threefold amplification. (Shown in Fig. 5.)

The printing-keys and the mechanism operated by them directly.—The printing-keys 164 are five in number and comprise a horizontal portion and a vertical member 165. The top 89 of the keyboard-frame is rounded at its central portion, Fig. 1, so that the operator may hold the hand in a natural and convenient position, with three fingers stretched in advance of the thumb and little finger. The vertical members 165 of the keys slide up and down in guideways 166 of the keyboard-frame, Figs. 13, 14, and 15, and carry pins 167, on which are journaled rollers 168. Between these rollers or pulleys are journaled on pins 169, secured to the keyboard-frame, another series of pulleys 170. All of these pulleys 168 and 170 are engaged by a flexible band, chain, or cord 171, which passes under the movable key-pulleys 168 and over the relatively-stationary frame-pulleys 170, Fig. 4. One end of said cord 171 is secured to one of the keys, as at 172, and on the same key is pivoted at 173 an eccentric pulley 174 for the purpose of adjusting the initial position of the cord. The downward movement of the keys is limited by the stop-pins 102, hereinbefore referred to. These pins project to the same height for the key to which the cord 171 is fastened and for the key adjacent to it. For the next key the distance from the stop to the key when in its normal position is twice as great and for the last two keys four times as great as for the first two. The last key, as shown at 165[a], has a forked vertical portion, each member of the fork extending at one side of one of the stationary pulleys 170 and carrying a movable pulley 168. Since one end of the cord is secured to the first key, the movement of this key, although equal in extent to that of the second key, will produce a longitudinal movement of the cord equal to only one-half of the movement produced by the depression of the second key, the pulley 168 of which engages the cord between two fixed pulleys 170. The depression of the third and fourth keys will move the cord longitudinally twice and four times as far, respectively, as the depression of the second key, and although the fourth and fifth keys have the same range of movement the action of the fifth key on the cord is doubled by the provision of two pulleys on said key with a fixed pulley between them. It follows that the keys when depressed singly will produce longitudinal movement of the cord, the extent of which will be for the several keys in the ratio of one, two, four, eight, and sixteen. By separating only one key or two, three, four, or all five in unison it is possible to obtain a longitudinal movement of the cord equal to any entire multiple up to thirty-one (the sum of one, two, four, eight, and sixteen) of the movement produced by the depression of the first key. This longitudinal movement is transmitted to the type-bands as follows: From the last pulley 158 the cord 171 passes up to a pulley 175, journaled in the keyboard-frame near the top thereof, and then horizontally back to a pulley 176, journaled on the keyboard-frame about a vertical axis, Figs. 3 and 5. The cord then passes longitudinally of the machine to a carriage 177, sliding in guides 178 and drawn toward one end thereof by a spring 179. The carriage 177 has a depending member 180, Figs. 5 and 15, which engages a plate 181 at the top of the type-band carriage 160 in such a manner as to allow the member 180 to slide on said plate 181 when the impression-frame and with it the carriage 160 are moved transversely of the keyboard-frame. The springs 148 keep the member 180 and the plate 181 in engagement with each other, while the spring 179 keeps the cord 171 taut and returns the keys to their normal or elevated position when released, shoulders 165[b] limiting the upward movement of the keys, Fig. 4.

Operation: The operation of the line-spacer and of the bell being similar to that of analogous devices now in use will require no further explanation. As above described, a depression of one of the keys 164 or of a number of them causes a longitudinal movement of the cord 171 and of the type-bands 146. This movement is different in extent for each key and for each combination of them, the various movements possible forming an arithmetical series with the constant difference of one unit—that is, one, two, three, up to thirty-one. If, therefore, each type-band has thirty-one characters at regular intervals, any one of these characters can be brought into a predetermined position (the printing position) by the actuation of an appropriate key or number of keys. A table, which the operator would soon commit to memory, would indicate the keys and combinations corresponding to each character. Supposing the first key only is depressed, this would bring into

the printing position at the end of the type-box 140 a predetermined character on each of the three type-bands 146. One of these three characters, however, would project downwardly beyond those on the adjacent bands and beyond the bottom of the type-box owing to the engagement of the projection 104 on the keyboard-frame with the top plate 156 of one of the bars or type-band depressors 153. This movement of the type-bands 146 would take place while the key is moved alone—that is, until it comes in contact with its stop 102. From then on further depression of the key or keys will cause no longitudinal movement of the type-bands, but will depress the keyboard-frame relatively to the carriage. This movement of the keyboard-frame has two functions—viz., first, to effect the printing as soon as the protruding character comes in contact with the writing-surface, and, second, to prepare the carriage-feed mechanism for action. This is accomplished as follows: It will be remembered that the spring 96 presses on the arm 92, Fig. 17, in such a manner as to hold the pin 77 of the sector 76 in engagement with the projection 99 of the keyboard-frame. As this lug moves downward during the depression of the keyboard-frame, the spring 96 causes the pin 77 to remain in contact with the lug 99, so that the sector 76 turns in the direction indicated by the arrow in Fig. 13. The pawl 79 prevents the worm 71 and ratchet 74 from following this movement, and thus the pawl 75 glides over the teeth of the ratchet without turning it. The extent of movement of the sector is determined by the position and shape of the stop 145, since said stop arrests the movement of the lever 94 when the pin 98 engages the stop, the further downward movement of the projection 99 having then no effect upon the arm 92. It will be obvious that if the stop 145 is quite close to the initial position of the pin 98 the movement of the latter and of the sector 76 will be comparatively slight. This movement, as will be explained presently, is proportionate to the feed of the main carriage after each impression. It often is desirable that the feed should be greater for a certain class of characters than for another—say greater for capitals than for small letters. This can readily be obtained by making the stop 145 stepped, as shown in Figs. 7, 8, and 17. The central cut-out portion of the stop would correspond in location to the type-band 146, on which the capital types are carried, while the end portions nearer to the pin 98 would correspond to the type-bands carrying small letters, figures, punctuation-marks, and other signs. The printed type can thus be properly spaced. Inasmuch as the type-box 140 is removable and exchangeable, the same machine can be readily used for type of different sizes or arrangement and for various languages. When the keyboard-frame rises again upon being released, the projection 99 comes in contact with the pin 77 and turns the sector 76 against the tension of the spring 96 a distance equal to the previous rotary movement of the sector. The pawl 75 during this return movement turns the ratchet-wheel 74 and the worm 71, causing the main carriage to be fed along the guide 28 an appropriate distance, as described.

When it is desired to shift the carriage quickly, it may be released from the rack 38 by swinging the worm-box 69 upward, as described. An accidental upward movement of the said box is prevented by the downward pressure of the spring 83 on the bottom plate of the box.

The opening or window 107 in the impression-frame, Fig. 6, enables the operator to ascertain if the carriage 160 is in its proper position, for which purpose the guides 161 may be provided with a suitable mark or gage. Should the carriage 160 require adjustment, this is done by turning the eccentric-pulley 174, Fig. 4, on its axis 173. This shifts the carriage 177 and also the carriage 160, since the springs 148 keep both carriages in contact with each other. When the type-box 140 is removed, the spring 179 still keeps the keys 164 up and the cord 171 taut.

The change from one type-band 146 to another is readily made by operating one or the other of the lateral shifting-keys 125 and 132. The lever 121 when in its central position, Fig. 16, causes the impression-frame to normally remain in the central position, in which the type-band carrying the capitals is in its operative position.

The spacing between words is effected by depressing the whole keyboard-frame without touching any one of the keys. It may also be effected by a partial depression of the said frame while leaving the fingers on the keys, so as to depress some of them. In this case each type-band might carry thirty-two characters, one of them being adapted to be printed by the complete depression of the keyboard-frame without touching the keys.

The provision of two inking-pads 151 and 157 at each side of the impression-point enables me to keep the type well inked without requiring a return of the type-bands to their normal position after each impression.

As the impression-point is at the left-hand corner of the main carriage of the machine, which after each impression is fed toward the right, it follows that the writing is plainly in sight.

The improved machine is very compact, capable of neat and relatively-quick work, allows for a ready exchange of characters, and, in brief, possesses many features which make it particularly adapted for the use of travelers, although of course it is capable of a much more general application.

It will be obvious that many modifications may be made without departing from the nature of my invention. Thus I have already referred to a modification of the carriage 160 for the purpose of amplifying the movement

of the type-bands 146 twofold instead of threefold. It will be obvious that slight changes of construction will enable the manufacturer to increase the movement fourfold or more, if desired, or by securing the ends of the type-bands to the carriage 160 directly the amplification of the movement may be dispensed with. The object of the amplification is to enable the type 149 to be better spaced and better secured on the type-bands without increasing the movement of the keys 164. It will further be obvious that in very simple machines one or two type-bands would do, while in exceptional cases more than three might be required. Accordingly I would either omit the type-band-shifting keys 125 and 132 entirely (when only one type-band is employed) or provide only one of them (for two type-bands) or a greater number than two, if necessary. Other changes of an analogous nature may be made.

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

1. A type-writer, provided with a movable band carrying a series of type, a support on which one end of said band winds spirally, means for moving said band longitudinally to bring any one of the types into the printing position, and mechanism for pressing the type which is in the printing position, against the writing-surface.

2. A type-writer, provided with a plurality of longitudinally-movable bands each carrying a series of type, means for moving any one of the bands transversely to cause it to project beyond its neighbors, means for moving the bands longitudinally to bring any one of the types into the printing position, and mechanism for pressing the type which is in the printing position, against the writing-surface.

3. A type-writer, provided with a plurality of movable type-bands arranged side by side and each carrying a longitudinal series of type, means for moving the bands longitudinally to bring any one of the types into the printing position, a projection arranged to shift one of the type-bands transversely so as to cause it to project beyond its neighbors, and means for effecting a lateral relative movement of the type-bands and said projection to bring any one of the type-bands into operative relation to said projection.

4. A type-writer, provided with a frame movable toward and from the writing-surface, a type-box movable forward and rearward in said frame, type-bands arranged side by side in said box and each carrying a longitudinal series of type, means for moving the bands longitudinally to bring any one of the types into the printing position, and a projection arranged upon the frame and constructed to shift the several type-bands transversely in succession as the type-box is moved forward or rearward, to cause any one of the type-bands to project beyond its neighbors.

5. A type-writer, provided with a frame movable toward and from the writing-surface, a type-box movable forward and rearward in said frame, type-bands arranged side by side in said box and each carrying a longitudinal series of type, means for moving the bands longitudinally to bring any one of the types into the printing position, a projection arranged upon the frame and constructed to shift the several type-bands transversely in succession as the type-box is moved forward or rearward, to cause any one of the type-bands to project beyond its neighbors, and keys for moving the type-box.

6. A type-writer, provided with a frame movable toward and from the writing-surface, a type-box movable forward and rearward in said frame, type-bands arranged side by side in said box and each carrying a longitudinal series of type, means for moving the bands longitudinally to bring any one of the types into the printing position, a projection arranged upon the frame and constructed to shift the several type-bands transversely in succession as the type-box is moved forward or rearward, to cause any one of the type-bands to project beyond its neighbors, keys for moving the type-box in one direction through different distances, and a spring for returning the type-box in the other direction.

7. A type-writer, provided with a frame movable toward and from the writing-surface, a type-box movable forward and rearward in said frame, type-bands arranged side by side in said box and each carrying a longitudinal series of type, means for moving the bands longitudinally to bring any one of the types into the printing position, a projection arranged upon the frame and constructed to shift the several type-bands transversely in succession as the type-box is moved forward or rearward, to cause any one of the type-bands to project beyond its neighbors, keys for moving the type-box in one direction through different distances, a spring for returning the type-box in the other direction, and a movable stop or lever for limiting the return movement of the type-box.

8. A type-writer, comprising a suitable base or guide, a carriage movable along said guide, a keyboard-frame movable on the carriage toward and from the writing-surface, a type-box movable forward and rearward in said frame, type-bands arranged side by side in said box and each carrying a longitudinal series of type, keys mounted on the keyboard-frame and constructed to move the type-bands longitudinally to bring any one of the types into the printing position, a projection arranged on the keyboard-frame and constructed to shift that type-band which at the time registers with said projection, transversely to project it beyond its neighbors, a shifting-key for moving the type-box in one direction, and a spring for returning the type-box.

9. A type-writer, comprising a suitable base or guide, a carriage movable along said guide,

a keyboard-frame movable on the carriage toward and from the writing-surface, an impression-frame movable forward and rearward in the keyboard-frame, a type-box removable from the impression-frame longitudinally of the carriage-guide, type-bands arranged side by side in said box and each carrying a longitudinal series of type, keys mounted on the keyboard-frame and constructed to move the type-bands longitudinally to bring any one of the types into the printing position, a projection arranged on the keyboard-frame and constructed to shift that type-band which at the time registers with said projection, transversely to project it beyond its neighbors, a shifting-key for moving the impression-frame in one direction, and a spring for returning the impression-frame.

10. A type-writer comprising a suitable base or guide, a carriage movable along said guide, a keyboard-frame movable on the carriage toward and from the writing-surface, a type-box movable forward and rearward in said frame, type-bands arranged side by side in said box and each carrying a longitudinal series of type, keys mounted on the keyboard-frame and constructed to move the type-bands longitudinally to bring any one of the types into the printing position, a projection arranged on the keyboard-frame and constructed to shift that type-band which at the time registers with said projection, transversely to project it beyond its neighbors, a shifting-key for moving the type-box in one direction, a spring for returning the type-box, and a carriage-feed mechanism operated by the movement of the keyboard-frame.

11. In a type-writer or like machine, a plurality of type-carriers located side by side and each having a line or series of types, adjacent types of different carriers being normally located in approximately the same plane, means for moving one of the type-carriers transversely to cause it to project from its neighbor or neighbors, and means for bringing the projected type against the writing-surface.

12. In a type-writer or the like, the combination with a movable type-carrier, keys, and a flexible connection movable longitudinally by the keys, of a carriage operated by said connection directly, a pulley journaled in the carriage, a flexible part extending from the type-carrier and passing around said pulley, and means for fastening the end of said flexible part so as to cause said part to have a plurality of runs at the carriage.

13. In a type-writer or like machine, a type-box containing a type-carrier with a carriage for moving said type-carrier, a series of keys, a flexible connection arranged to be moved longitudinally by said keys, and another carriage secured to said flexible connection, the two carriages engaging each other.

14. In a type-writer or like machine, a main carriage, a feed mechanism therefor, said mechanism including a spring-pressed lever, and a type-box carrying a stop in the path of said lever to regulate the throw of the lever and the extent of the feed.

15. In a type-writer or like machine, a main carriage, a feed mechanism therefor, said mechanism including a spring-pressed lever, a type-box movable laterally and containing a plurality of type-carriers arranged side by side, and a stop secured to the type-box to regulate the throw of said lever and the extent of the feed, said stop being stepped to allow for a different throw of the lever for different type-carriers.

16. In a type-writer or like machine, a main carriage, a feed mechanism therefor, a type-box containing a plurality of type-carriers and movable laterally to bring any one of said carriers into an operative position, and means for varying the travel of the carriage by the lateral movement of the type-box.

17. In a type-writer or like machine, a main carriage, a feed mechanism therefor, a type-box containing a plurality of type-carriers and movable laterally to bring any one of said carriers into an operative position, and a stepped stop carried by the type-box for varying the travel of the carriage.

18. In a type-writer or like machine, a series of keys having guides or pulleys, a series of stationary guides or pulleys located between the key-guides, a flexible connection passed in contact with all of said guides, a pulley journaled eccentrically and engaging said flexible connection to adjust the initial position thereof, and a type-carrier controlled by the longitudinal movement of said flexible connection.

19. The combination of the main carriage, the keyboard-frame movable vertically thereon and carrying type and keys for bringing the type into the printing position, and the carriage-feed mechanism comprising a rotatable sector having a feed-pawl, a ratchet-wheel operated by the pawl and operatively connected with the carriage, and a projection extending from said sector and adapted to be actuated by engagement with the keyboard-frame.

20. In a type-writer, a frame having a guide-way, a type-box adapted to slide in said guide-way, a spring-catch for locking the box to the frame, and a handle pivoted to the box and provided with a crank portion to engage the catch and release the box.

21. In a type-writer, a base or guide having a main portion and an extension hinged thereto and adapted to be folded against the main portion, and a carriage or type-writer proper arranged to travel on the main portion of the guide and upon its extension, the aggregate length of the carriage and of the extension being approximately equal to the length of the main portion of the guide.

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Witnesses:
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