Oct. 1, 1946. J. L. STIXRUD 2,408,452

SHORTHAND TYPEWRITING MACHINE

Filed Nov. 8, 1943 3 Sheets-Sheet 1

Fig. 2.

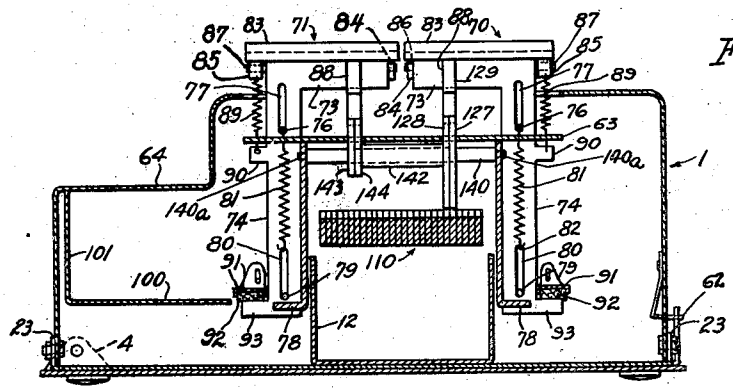


Fig. 3.

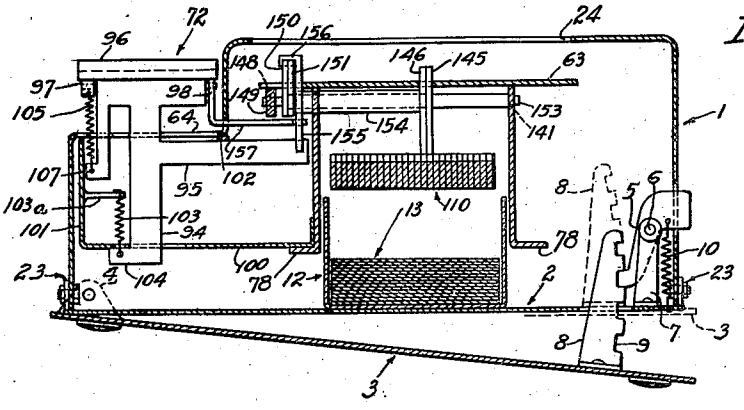
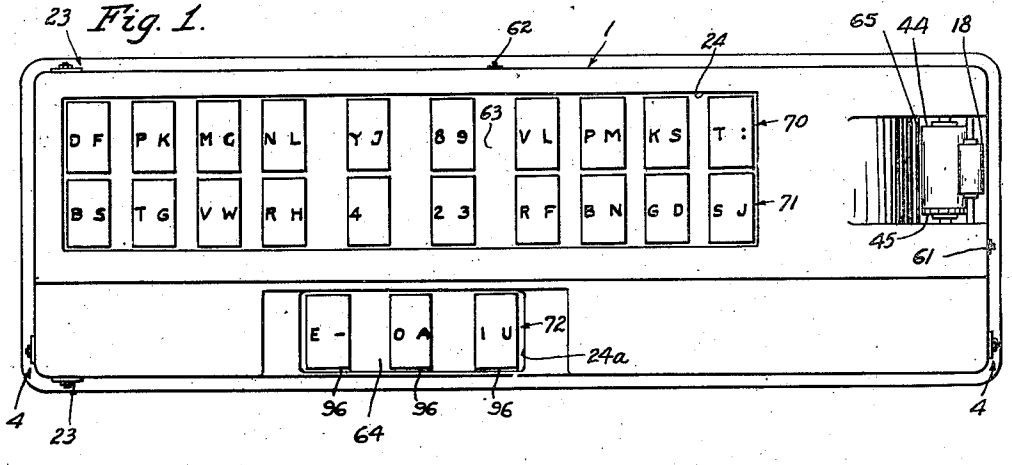


Fig. 1.



INVENTOR

John L. Stixrud

BY Robt. W. Pearson

ATTORNEY

Oct. 1, 1946. J. L. STIXRUD 2,408,452

SHORTHAND TYPEWRITING MACHINE

Filed Nov. 8, 1943 3 Sheets-Sheet 2

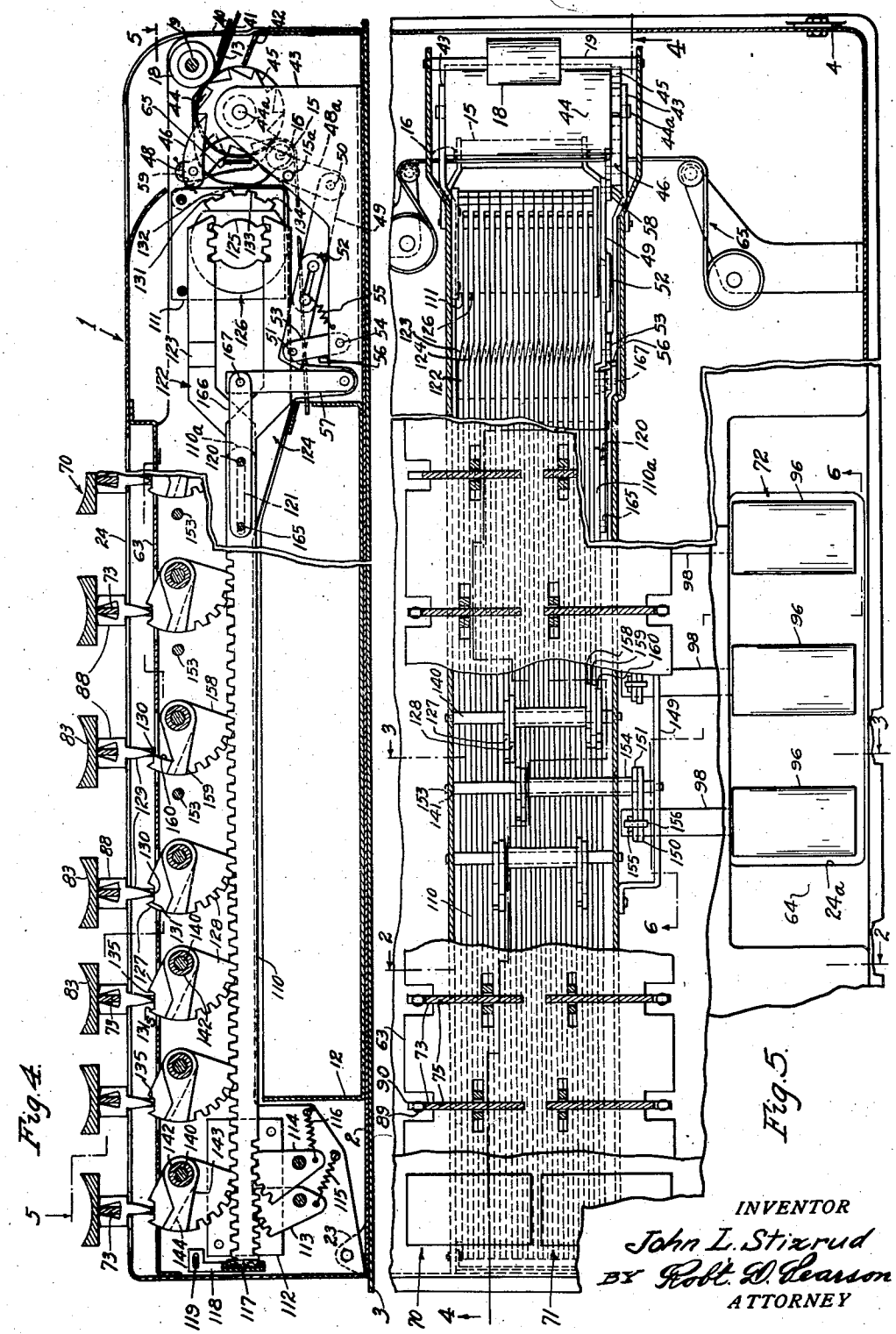


Fig. 4.

Fig. 5.

INVENTOR
John L. Stixrud
BY Robt. D. Pearson
ATTORNEY

Oct. 1, 1946. J. L. STIXRUD 2,408,452

SHORTHAND TYPEWRITING MACHINE

Filed Nov. 8, 1943 3 Sheets-Sheet 3

Fig. 6.

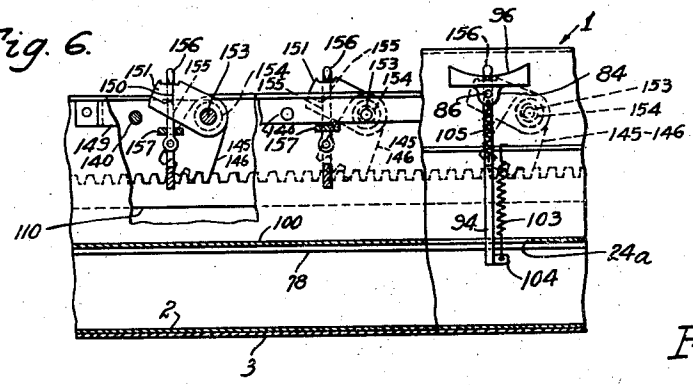


Fig. 8.

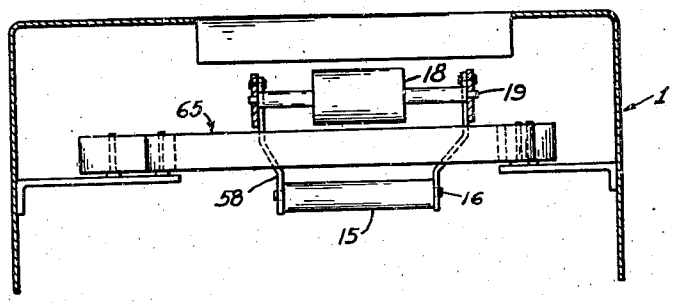
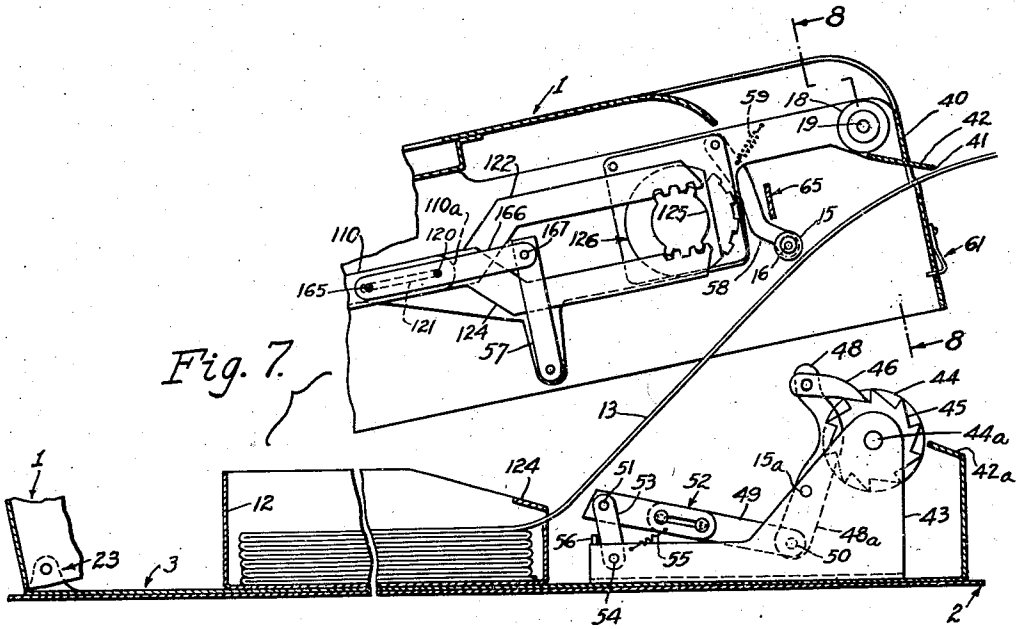


Fig. 7.



INVENTOR

John L. Stixrud

BY Robt. W. Pearson

ATTORNEY

Patented Oct. 1, 1946 2,408,452

UNITED STATES PATENT OFFICE

2,408,452

SHORTHAND TYPEWRITING MACHINE

John L. Stixrud, Los Angeles, Calif.

Application November 8, 1943, Serial No. 509,514

11 Claims. (Cl. 197—9)

1

This invention relates to typewriting machines and more particularly to shorthand typewriting machines by means of which the operator is able to type several letters or characters at a single stroke on the keyboard, and the primary purpose of which is to attain great speed in writing.

Among the objects of the invention are: To provide a new kind of finger-depressible key which may be struck in such a way as to be tilted in a plurality of different directions to imprint different type letters, thereby reducing the number of keys heretofore found necessary to provide for typing, for example, the various letters of the English alphabet; to render the casing for containing the working parts of the minimum size considering the character of the typing mechanism contained therein; and to provide a simplified means for mounting and controlling the operation of the aforesaid keys.

The invention includes, among other novel features, an outstanding departure from the conventional arrangement of typewriting machines in that the platen is placed on the side of the machine rather than facing the operator. Accordingly, the bars or rods for actuating the printing mechanism are arranged so as to extend toward and from the platen. The keys and their supporting bars cross the printing bars at a right angle. By this novel arrangement a great many advantages and improvements over existing typewriting machines and shorthand typewriting machines are obtained.

In order to promote speed of operation a shorthand machine should have a simple keyboard with a relatively small number or keys. On the other hand it is desirable that the machine include sufficient characters to represent all the sounds of the spoken language. In shorthand machines as hitherto constructed the keyboard has usually been either cumbersome due to a large number of keys, or else because of a system of codes to express the missing characters, additional time and effort has been required to learn the codes along with how to operate the machine. Only persons who are familiar with these codes can understand the typed product. This machine, in the emodiment thereof illustrated in the drawings, has a keyboard of only 23 keys. With these keys the operator can type 45 letters or characters, which number is sufficient to write English without the use of codes.

While the primary object of the invention is to provide a shorthand machine, yet other uses are possible. For, as the words and sentences printed by the machine can be understood by

2

any average person, it is not necessary to retype a message on the typewriter if it is of an informal nature, such as an inter-department communication. If great urgency exists, for example, of a military nature, the paper strip can be torn off and dispatched and the contents can be easily read and understood by the recipient.

It may happen during the operation of a shorthand machine that the supply of paper becomes exhausted. It then becomes necessary to refill the paper container and rethread the paper strip around the platen and the associated rollers. It is important that as little time as possible be lost in this operation. With these requirements in view it is an object of this invention to provide a simplified and otherwise improved arrangement of the structure to afford quicker access to the interior of the machine so that a new supply of paper can be more quickly put in place and speedily arranged for a continuance of the typing operation.

Other objects, advantages and features of invention will hereinafter appear.

Referring to the accompanying drawings, which illustrate what is at present deemed to be a preferred embodiment of the invention,

Fig. 1 is a plan view of the complete machine.

Fig. 2 is a section on line 2—2 of Fig. 5.

Fig. 3 is a section on line 3—3 of Fig. 5.

Fig. 4 is a view showing the machine partly in side elevation and partly sectioned on irregular line 4—4 of Fig. 5, parts being broken out to shorten the view.

Fig. 5 is a view partly in plan and partly in horizontal section on line 5—5 of Fig. 4, parts being broken out to contract the view.

Fig. 6 is a fragmental vertical section on line 6—6 of Fig. 5.

Fig. 7 is a fragmental view of Fig. 4 showing the device in an open position ready to install the paper strip to be typed upon.

Fig. 8 is a sectional view on line 8—8 of Fig. 7.

Referring in detail to the drawings, the terms "near" and "far" as hereinafter used in describing the machine, refer to the same as viewed in Figs. 1, 4 and 5.

The machine has a frame or housing portion 1 which is upwarly swingable in relation to its double base which consists of plates 2 and 3. The lower of these plates 3 is hinged on the near side of the frame 4 and is held in position on the far side by the lever 5 pivoting on the pin 6 on the arm 7 which is fastened to the base. The lower base plate 3 has an upstanding rack member 8 with a series of grooves 9 into which the

hammer head of the lever 5 is held by the spring 10. The bottom of the machine is suitably cushioned.

Fastened to the base plate 2 is the paper container 12 into which is placed the folded paper strip 13 on which the printing is done. The end portion of the paper strip emerges (as indicated in Figs. 4 and 7) from the paper container 12. The guide roller 15, which pivots on the shaft 16 is fastened to the frame by means of the arms 58, is caused by a spring 59 to hold the paper strip close to the platen.

The rubber roller 18, pivoted on the shaft 19 mounted on the frame 1, serves the purpose of holding the paper strip against the platen. The shield 40 and the paper guide 42 are both supported from the frame 1 in any suitable manner. The paper shield 42 is serrated at 41 to facilitate tearing off the paper strip when desired.

The platen 44 pivots on the shaft 44*a* fastened to the brackets 43. On the near end of the platen is a ratchet wheel 45. The dog 46 is carried by the pivoted layer 48. This lever swings upon the shaft 15*a* carried by bracket 43. One end of the bar 49 is pivotally connected by means of a pin 50 to the lower arm 48*a* of the lever 48, the opposite end of said bar 49 being pivotally connected by a pin 51 to the upper end of a swingable bar 53. The adapter 52 serves to adjust the length of the bar 49. The bar 53 pivots at its lower end on a pin 54 fastened to the bracket 43. The spring 55 holds the edge of the bar 53 against a stop 56 so that the end of said bar 49 is just in front of the arm 57, which is part of the spacing mechanism of the machine to be explained later. When the arm 57 moves towards the right (Fig. 4), it pushes the arm 49 toward the right causing the dog 46 to move away from the ratchet wheel one notch. When the arm 57 returns to neutral position the spring 55 will cause the lever 48 to return to its neutral position, thus causing the dog 46 to move forward and turn the platen one notch thus spacing the printed writing.

It will be noticed from the above description that the paper container, platen, spacing mechanism and a shield 42*a* are fastened to the base of the machine and that all other parts are fastened to its frame 1, the frame 1 being hinged at the extreme left (see Figs. 4 and 7), to the base at 23. Said frame and top and side covers are detachably connected by the clasp 61 at the extreme right, and the top and side cover is connected to the base by a similar clasp 62 at the far side of frame 1. By releasing the clasp 61 the top and side cover carrying with it the frame 1 can be lifted up lid fashion exposing the paper container and the platen which are fastened to the base plate. A new supply of paper can then be inserted into the paper container, the free end of the paper strip pulled over the platen, and by closing the machine, the guide rollers and the paper shield will be caused to fall into their proper places, the machine then being refilled and ready for further operation.

If it is desired to inspect or adjust the printing assembly 65 or other parts of the mechanism fastened to the frame, the top and side cover can be lifted after the clamps 61 and 62 have been released. Then the top and side cover can be raised but the frame will remain in position. Apertures 24 and 24*a* are provided around the keys to permit the removal of the top and side cover when they are disconnected from the enclosed frame. To protect the internal mechanism and improve the appearance of the machine,

top plates 63 and 64 are provided to cover the parts underneath the keys.

The keyboard has three rows of keys 70, 71 and 72. As the keys in each row act alike the description of one key assembly in each row will suffice. The key plate having marked upon it "DF" in row 70 is supported by the shoulder 73 of the angular key bar 74 which extends downward on the far side of the chassis and is held in place by the groove 75 (see Fig. 5) in the edge of the top plate 63. The upper guide bar 76 extends the length of the keyboard, is fastened to the top plate 63 and penetrates the key bar 74 through the slot 77. The lower part of the key bar 74 is held in place by the lower edge of the frame 78 which is bent at right angle at this point. The lower guide bar 79 extending the length of the keyboard, is fastened to the frame edge 78 and penetrates the slot 80 in the key bar 74. The spring 81 fastened to the tongue 82 (see Fig. 2) and to the guide bar 76 returns the angle bar to normal position after being depressed. The key plate 83 has lugs 84 and 85 extending downward. These lugs have bearing apertures 86 and 87. The shoulder 73 carries pins penetrating the apertures 86 and 87 of the lugs 84 and 85 respectively, permitting the keyplate to pivot around these pins so that the key plates can be tipped to the right or to the left if touched off center by the operator. The apertured stop lugs 88 fastened to the key plate 73 limits this tipping. The spring 89 fastened to the lower end of the lug 85 and the arm 90 protruding from the key bar 74 keeps the key plate 83 in its horizontal position when not operated. The angle iron 91 running the length of the keyboard has a cushion of felt or similar material 92 fastened to it and acts as a stop for the bar 74 by contact with the arm 93. The angle iron 91 is fastened to the frame and is adjustable.

The keys in row 72 are three in number and are actuated by the thumbs of the operator. For convenience of operation they are placed lower than the rows 70 and 71 and their arrangement differs to a certain extent. The T-shaped arm or key bar 94 has an arm 95 extending toward the center of the machine the purpose of which will be explained later. The key plate 96 pivots at 97 and 98, the pivoting and stop arrangement being the same as described for the keys in rows 70 and 71. The arm 94 is held in place by an aperture in the bottom plate 100, said plate being fastened to and extending from the frame of the machine and being connected by an end plate 101. The felt pad 102 fastened on the underside of the top plate 64 serves as a stop after the arm 94 has been depressed, to limit the upward movement of said arm by engaging the extension 95 thereof. The spring 103 fastened to the connection 103*a* and the L-shaped arm 104 acts as a return spring. The spring 105 leading from the lower part of the pivot member 97 to the L-shaped arm 107 keeps the key plate 96 in its horizontal position when not operated.

Running substantially the length of the machine from the platen to the opposite end of the machine is a plurality of strap like bars 110 held in upright position as to their breadth by the spacer plates 111 and 112 and supported on the left by the gear segments 113 and 114 which mesh with the bars. The springs 115 and 116 hold the ends of the bars against the stop 117 which consists of an angle bar 118 and a cushion. The angle bar 118 has screws in a slot 119 (see Fig. 4) for adjustments. At the right of the machine the

bars 110 rest on the guide pin 120 extending across the frame through the slots 121 of said bars. The bars 110 are arranged in coacting pairs. The bar on the far side of each pair has an arm 122 extending upward and slightly bent laterally at the point 123 so that the right end portion of said arm is directly over the arm of the coacting bar 124. These arms have rack portions at the right end and between them is the floating gear 125 forming a concentric, laterally extending part of the printing wheel 126 held in an upright position by the spacer plates 111. On the right hand portion of the periphery of the printing wheel and facing the platen are four circumferentially spaced apart letters or characters 131, 132, 133 and 134. When the floating gear is in its normal position two of these characters are located above the axis of the wheel and the other two therebelow.

Meshing with the far side bar of the coacting pair of bars is a gear segment 127 fixed to the shaft 140 which rotates in the bearing holes 140a. Meshing with the near side bar of the coacting pair is a gear 128 fixed to the hollow shaft 142 which pivots on the shaft 140. Directly above these gears and extending downward from the apertured stop lug 88 is an integral finger 129. The thickness of this finger is equal to the combined thickness of the two coacting gears 127 and 128. When in normal position said finger 129 is immediately above the middle point 130. When the operator touches the key plate 83 a little to the right of the center the finger 129 moves to the left to the point or shoulder 131. As the key 83 is thereupon depressed the finger 129 moves downward at this point and depresses the selected gear 127 causing the far side of the coacting bar 110 to move to the right. The arm 122 of said bar moving to the right acts on the upper edge of the gear 125 causing it to start a rolling motion in a clockwise direction until the finger 129 has depressed the gear 127, till its upper edge has reached the level of the upper edge of gear 128. At this point of the operation the printing wheel has turned clockwise so that the letter or character at 131 has reached the printing line, that is to say is directed horizontally and faces the platen. As the key 88 continues its downward motion both gears 127 and 128 are depressed and the connected coacting bars are pushed to the right at the same speed, causing the rolling motion of the printing wheel to be replaced by a side motion until the letter or character contacts the platen and the printing of that particular letter or character results.

If the operator touches the key plate a little to the left of the center the finger 129 will move to the right until it reaches the point 135. In this position the gear 127 will travel a longer distance before the finger 129 reaches the upper edge of gear 128. As a result the far side bar 110 which meshes with gear 127 will travel farther toward the right causing the clockwise rolling motion of the printing wheel 126 to be more extended so that by the time the finger 129 reaches the upper edge of the gear the letter 131 has moved downward till it is in the printing line. By the continued downward motion of the finger 129, now acting on the upper edge of both gears 127 and 128, these gears will cause both the associated coating bars to move to the right at the same speed. The clockwise motion of the printing wheel will thus stop and will be replaced by a side motion until the letter contacts the platen and the printing of this particular letter results.

As will be seen from this description the key plates in row 70 as represented by the key plate "DF" cause either one of the two upper letters on the printing wheel to be printed according to how the key plate "DF" is being tipped, either to the right or the left, as the key is being depressed.

The two lower letters on the printing wheels 133 and 134 are similarly actuated by the key plates in row 71 as represented by the key "BS." Fixed to the shaft 140 is the arm 143 and fixed to the hollow shaft 142 is the arm 144. The upper edges of these arms correspond in appearance to the upper edges of the gears 127 and 128 only the arms are reversely arranged, in such a manner that the upper edge which is first touched by the finger 129 now motivates the near side bar of that pair of the bars 110 which is located at the far side of the machine. The result is that as the finger underneath the "BS" plate, moves downward it first moves the near side bar 110 causing the arm 124 to move to the right turning the lower edge of the gear 125 forward creating a counterclockwise motion causing the letter at 133 or the letter at 134 on the printing wheel to move into the printing line according to whether the key plate "BS" is being tipped to the right or to the left.

The two keys "DF" and "BS" together control the four letters on the printing wheel facing the platen on the extreme far side of the machine. Similarly the pair of key plates "PK" and "TG" control the four letters on the second printing wheel counting from the far side of the machine. The key plates "MC" and "VW" control the third printing wheel, and so on, until the pair of key plates "T:" and "SJ" on the extreme right control the printing wheel nearest the operator.

It will be noted that the keys are marked on the drawings for explanatory purposes only. The keys on the machine representing said type will be blank.

The keys of a third row 72 are actuated by the thumbs and are used to print the vowels. Each key actuates its separate printing wheel which has only two letters or characters. The bars and the printing wheels connected with these keys are in the center of the bar and printing wheel arrangement 110. Fixed to the shaft 153 is a gear 145 and fixed to the hollow shaft 154 is a gear 146. The shafts 153 and 154 extend beyond the side of the frame through an aperture. The shaft 153 rotates at suitable bearing holes 141 and 148, the latter in an auxiliary plate 149 attached to the side of the frame. The arms 150 and 151 are fixed respectively too the near ends of the shafts 153 and 154. Hinged on the arm 95 and extending upward is a finger 155, the top of which extends above the upper edge of the arms 150 and 151, the L-shaped extension 156 of which protrudes above the arms 150 and 151. The finger 155 is kept in upright position by the fork shaped end of the L-shaped arm 157 which is fastened to the far side of the key plate 96. When the key plate 96 is tipped to the right the arm 157 will cause the finger 155 to move to the left directly over the arm 151 and when continuing the downward movement of the key assembly 96 the arm 151 and shaft 154 will cause the gear 146 to move the near side horizontal bar 110 toward the right causing the letter in position 133 on the printing wheel to move into the printing line. The continued downward

stroke will then also move the arm 150, the shaft 153 and gear 145 thereby causing simultaneous movement of both gears which moves the printing wheel into contact with the platen. When the key plate 96 is tipped to the left the arm 157 will cause the finger 155 to move to the right directly over the arm 150 actuating first the bar at the far side of the coacting bars 110 and causing the printing wheel to bring the related letter in position into the printing line and subsequently in contact with the platen.

The arrangement of each key assembly of each row is similar except the key which prints the numeral 4 and serves as a space key. The arrangement of this key is therefore different. The gears 127 and 128 are the same as for the other keys but the arms 158 and 159 are shorter than the arms 143 and 144 serving the other keys because only one character, the numeral 4 is to be printed. It is desired that no printing takes place when the key 4 (and space) is touched on the right side (the space side) but it is necessary that a bar be then moved sideways the same as is the case with the bars 110 in order that the spacing device will be actuated. An additional gear 160 (see Fig. 5) is therefore provided which is engaged by the finger 129 underneath the plate 4 (and space) and the width of this finger is extended to cover three thicknesses of the gears to accommodate this additional gear in addition to the arms 158 and 159. The gear 160 meshes with a bar 110*a* which is cut off shortly beyond the slot 121 and the guide pin 120 so as not to interfere with the printing wheels.

Extending through the slot 121 of all the bars 110 is a floating shaft 165. The near end of this shaft is connected with one end of the arm 166 the other end of said arm being pivotally connected at 167 to the aforesaid arm 57. When any of the bars 110, including the spacing bar, move to the right the shaft 165 will be pushed toward the right and move the bar 166 in the same direction thereby actuating the spacing device attached to the platen as has already been described, and also operating the inking device 65.

The arrangement of letters and characters on the printing mechanism is capable of many variations. As the keys which appear opposite each other in row 70 and 71 act in pairs sharing one printing wheel, only one of the four letters or characters indicated on each pair of same can be printed at any one time. In making this arrangement of the letters and characters of the key board care has been taken that letters attached to any one printing wheel do not as a rule appear together in words or syllables of the English language. A high degree of similarity in appearance exists between letters and numerals making it possible to use some of the letters as substitute for numerals and vice versa. Thus "I" will be used to express the numeral "1," the numeral "2" will be used to express the letter "Z," the initial letter "S" will be used to express the numeral "5," and "G" to express the numeral "6." The numeral "7" will be used to express the letters "I" and "J" and the numeral "8" to express the letter "X," while the numeral "9" will express the letter "Q." When so used even the uninitiated will have no difficulty in understanding their meaning. When writing vowels the "–" is used to indicate the pronunciation of the vowels to make phonetic expression easier; thus long O, A, I and U are preceded by the "–." Long E is written EA. Thus hod and hood are written HOD and H–OD; far and fare are written FAR and F–AR; bit and bite are written BIT and B–IT and dud and dude are written DUD and D–UD.

The character ":" at the extreme right key is used to indicate that a vowel at the end of a word is omitted. Thus ready is written READ:. Handy is written HAND:. This character can also, if desired, be used to express long vowels, thus fare, bite and dude can be written FAR:, BIT: and DUD:.

I claim:

1. In a machine of the kind described, a support, two bars mounted thereon in a generally adjacent parallel relation to each other, each of said bars having an end portion furnished along one side with a series of gear teeth, said two series of teeth being directed toward each other with a space between them, a floating gear occupying said space and in mesh with both of said series of teeth, a plurality of type characters circumferentially spaced along a peripheral portion of said gear, a manually depressible key mounted on said support, said key being initially adjustable to assume either of two positions preparatory to its depression, and means operatively connecting said key with both of said bars to impart to them a longitudinal movement when depressed, one of said bars being moved during the entire downward movement of said key and the other of said bars being moved only during a greater or lesser part of the final portion of the downward movement of said key, the extent of the movement of the latter bar depending upon the aforesaid initial adjustment of said key, and a platen mounted upon said support into a printing relation with which one of the type characters of said gear is brought at the end of the sliding movement of said bars after said key has been initially adjusted in one position, another of the type characters of said gear being contacted with said platen after said key is adjusted in the other of its initial positions.

2. The subject matter of claim 1 and, means whereby said bars and key are automatically returned to their original positions after the operation of said key.

3. In a machine of the kind described, in combination, a support, a depressible key bar mounted thereon, a key provided with a downwardly directed finger, said key being tiltably mounted on said bar by being pivoted thereto at a point above the lower end of said finger, an arm swingably mounted upon said support in a position to be contacted by said finger at a predetermined distance from the axis about which the arm swings when said key is depressed after being swung to one tilted position, said arm being contacted by said finger at a different distance from its axis of swing when said key is depressed after being tilted to another position, a plurality of type characters operatively connected with said swingable arm, the aforesaid variable swinging of said arm serving to select the predetermined character to be typed, and means mounted on said support to automatically restore the operating parts to their original positions after typing operations.

4. The subject matter of claim 3 and said arm having a side portion furnished with two shoulders at different distances from the axis about which the arm swings, said finger contacting with one of said shoulders in one tilted position of said key and with the other shoulder in the other tilted position thereof.

5. In a machine of the kind described, in combination, a support, a platen mounted thereon,

a floating-type-carrying wheel to cooperate with said platen, said wheel having gear teeth and a plurality of circumferentially spaced apart type on its periphery, a pair of bars mounted on said support to slide longitudinally toward and from said platen, said bars having parallel spaced apart rack portions one of which meshes with one side of said type wheel and the other with the opposite side thereof, key operated means mounted on said support whereby one of said bars is longitudinally moved a predetermined distance toward the platen and then the other bar is caused to move with it and at the same rate of speed until a selected type of the plurality on said floating wheel is caused to print a character upon a sheet of paper overlying said platen, and means to automatically restore the operating parts to their original positions after typing operations.

6. In a machine of the kind described, in combination, a rotary typing wheel having a plurality of type characters spaced on the peripherial surface thereof, a selectively actuated tiltable operating key to perform a selecting operation by its own movement in one of two directions, a pair of longitudinally movable bars operatively connecting the operating key with the typing wheel, the movement of one of said bars by the initial portion of the depression of said key during one selective tilting selecting the type to be presented and the movement of both of said bars by the full depression of said key during said one selective tilting moving the typing wheel into printing position in accordance with the selective movement of the operating key, and intervening mechanism operatively connecting said typing wheel, movable bars and operating key to carry out a printing operation.

7. In a machine of the kind described, in combination, a rotary type wheel having a plurality of type characters thereon, a pair of longitudinally slidable bars, each of said bars being operatively connected to said type wheel, a platen, a typing key, means operatively connecting said slidable bars and said typing key, said typing key being adapted to be tilted to engage, through the medium of said means, one of said slidable bars and to actuate the same upon initial depression to select the desired type character on said wheel, said key upon further depression actuating both of said slidable bars, through the medium of said means, to bodily move the type wheel with the selected character thereon into printing engagement with the platen.

8. In a machine of the kind described, in combination, a support, a depressible key bar mounted thereon which when released automatically returns to its original position, a key mounted on said bar to tilt from one to the other of either of two positions preparatory to being manually depressed together with said bar, said key having a downwardly directed finger, two members movably mounted upon said support in the path taken by said finger when said key is depressed, one of said members being moved during the entire operative downward movement of the key and the other being moved only during a greater or lesser part of the final portion of the downward movement of said key depending upon the initial tilting thereof, and typing means operatively connected with said members and including two type one or the other of which is selectively positioned for a printing operation by the initial movement of the full stroke member and subsequently moved into printing position by the combined movements of both members.

9. In a machine of the kind described, in combination, a support, a depressible key bar mounted thereon which when released automatically returns to its original position, a key mounted on said bar to tilt from one to the other of either of two positions preparatory to being manually depressed together with said bar, two members movably mounted upon said support in the path of said key, one of said members being moved during the entire operative downward movement of said key and the other being moved only during a greater or lesser part of the final portion of the downward movement of said key depending upon the initial tilting thereof, and typing means mounted upon said support and operatively connected with said members, said typing means including two type one or the other of which is selectively positioned for a printing operation by the movement of one of said movable members and subsequently moved into printing position by the combined movement of both of said members.

10. In a machine of the kind described, in combination, a support, a depressible key bar mounted thereon which when released automatically returns to its original position, a key mounted on said bar to tilt from one to the other of either of two positions preparatory to being manually depressed together with said bar, said key having a downwardly directed finger, gear segments pivotally mounted upon said support in the path taken by said finger when said key is depressed to be turned thereby, the aforesaid tilting of said key varying the contact distance of said finger in relation to the axis about which said gear segments turn, thereby varying the amount of the turning movement imparted to said gear segments by each complete depression of said key, typing mechanism mounted upon said support and comprising two type characters, a platen in cooperative relation to said type characters, operative means between said gear segments and said type characters whereby one of said type characters is directed toward said platen by a full depression of the aforesaid key when tilted to one position and the other of said type characters is directed toward said platen by a full depression of said key when tilted to its other position, and means whereby said key bar, gear segments and typing mechanism are automatically restored to normal position after each printing operation.

11. The subject matter of claim 10 and, one of said gear segments having an edge portion furnished with two shoulders at different distances from the axis about which such gear segment turns, said finger contacting with one of said shoulders in one tilted position of the key and with the other shoulder in the other tilted position thereof.

JOHN L. STIXRUD.