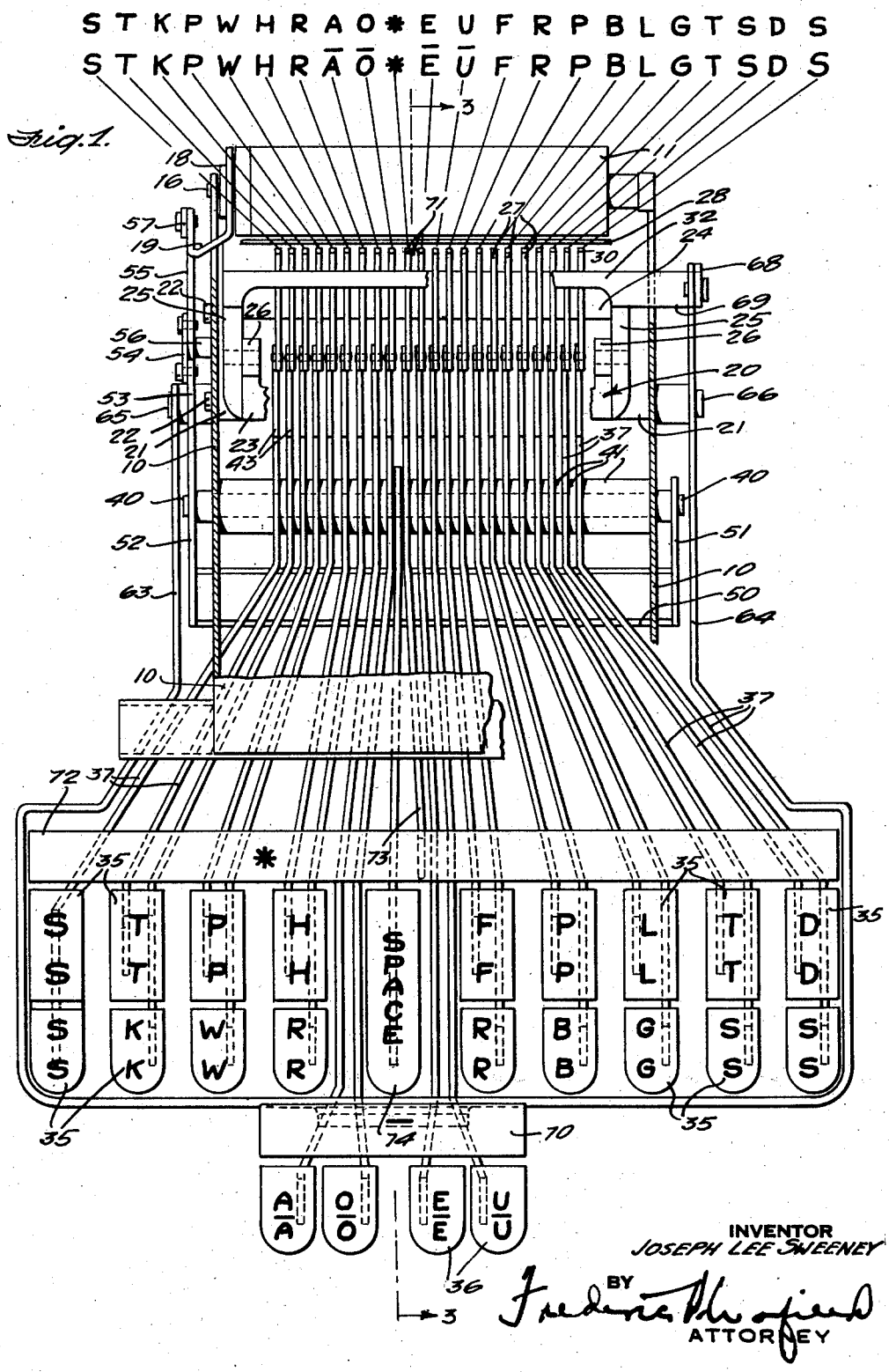
May 7, 1946. J. L. SWEENEY 2,399,769

SHORTHAND TYPEWRITING MACHINE

Filed March 5, 1941 8 Sheets-Sheet 1

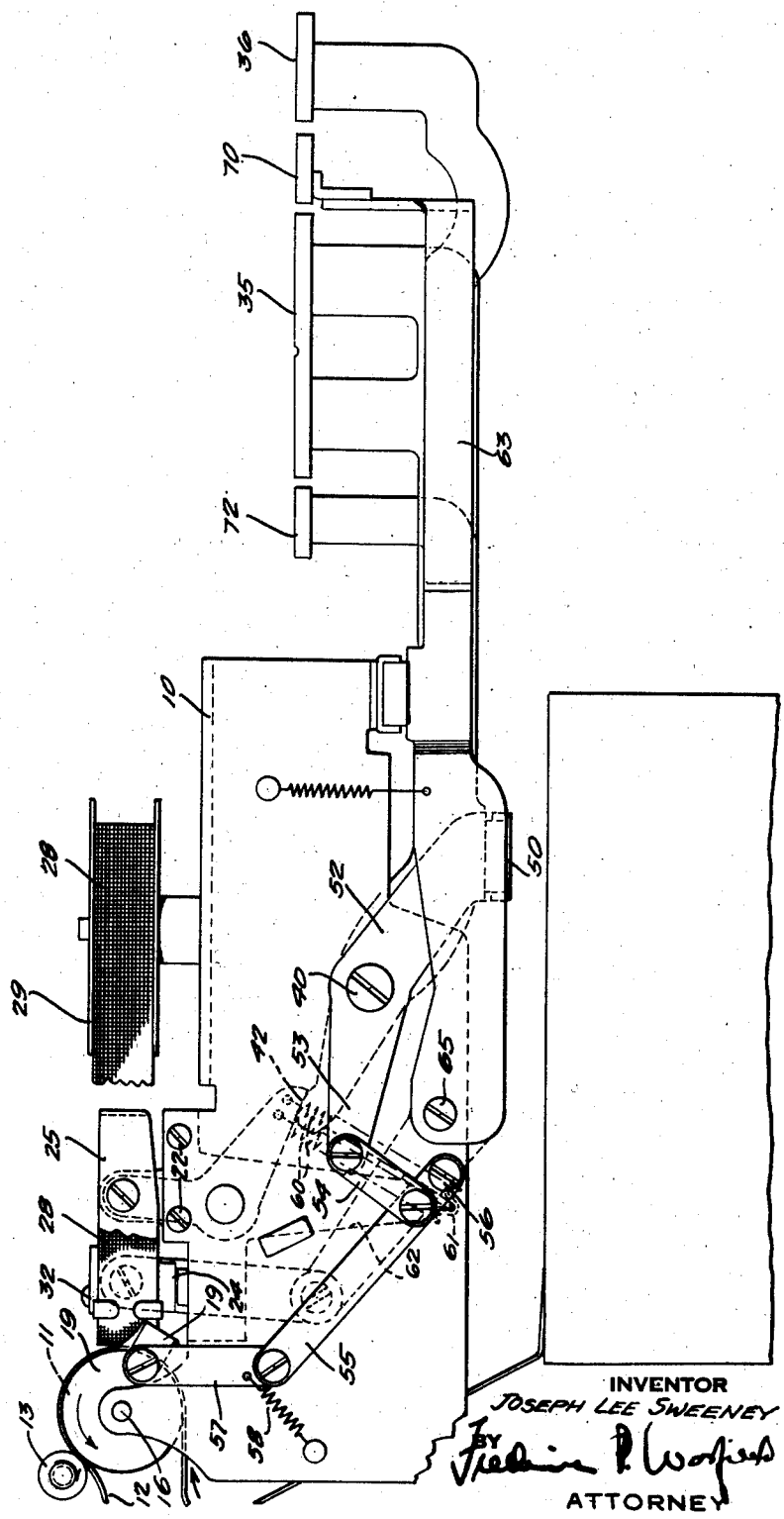


May 7, 1946. J. L. SWEENEY 2,399,769

SHORTHAND TYPEWRITING MACHINE

Filed March 5, 1941 8 Sheets-Sheet 2

Fig. 2.



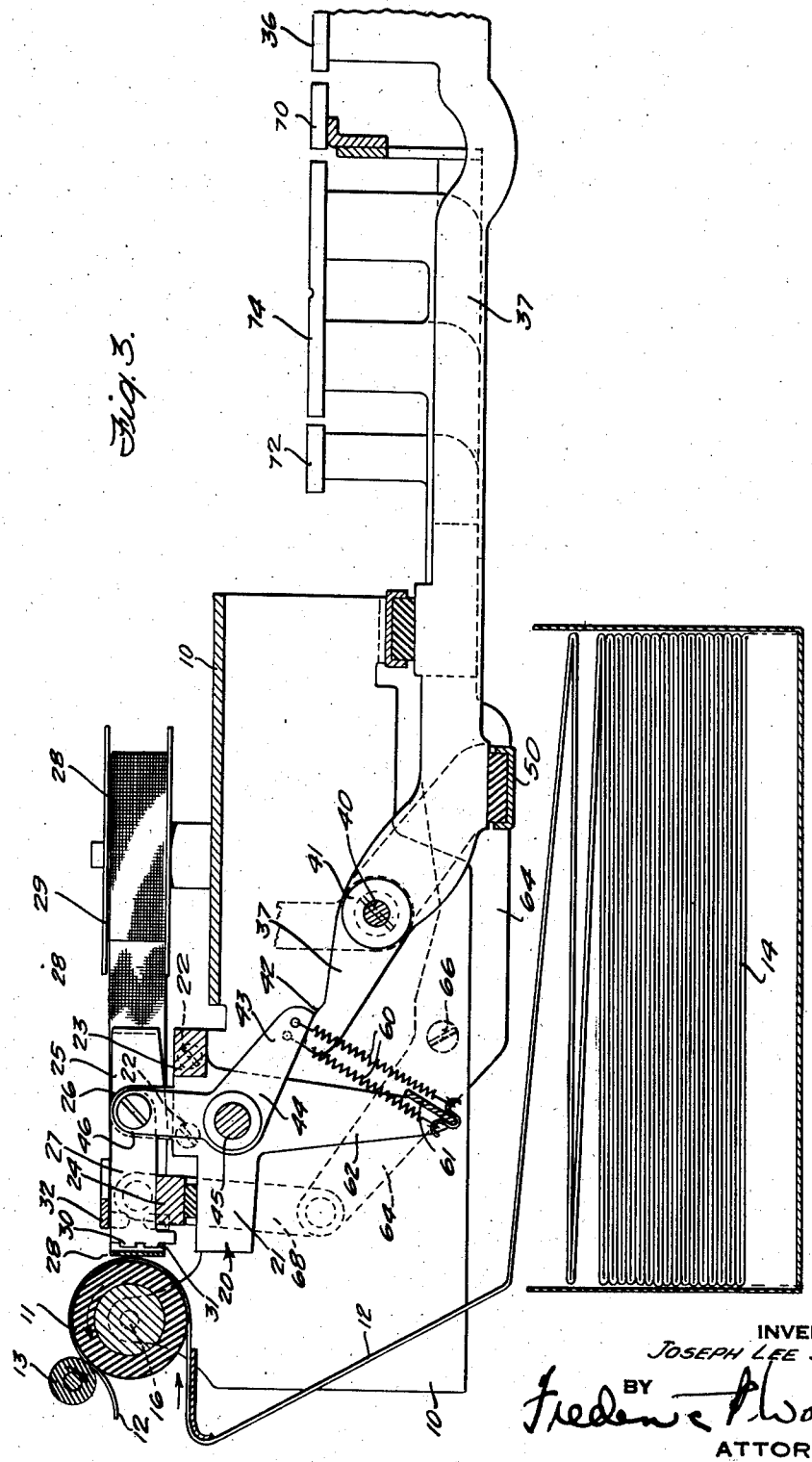
INVENTOR
JOSEPH LEE SWEENEY
BY
ATTORNEY

May 7, 1946. J. L. SWEENEY 2,399,769

SHORTHAND TYPEWRITING MACHINE

Filed March 5, 1941 8 Sheets-Sheet 3

Fig. 3.

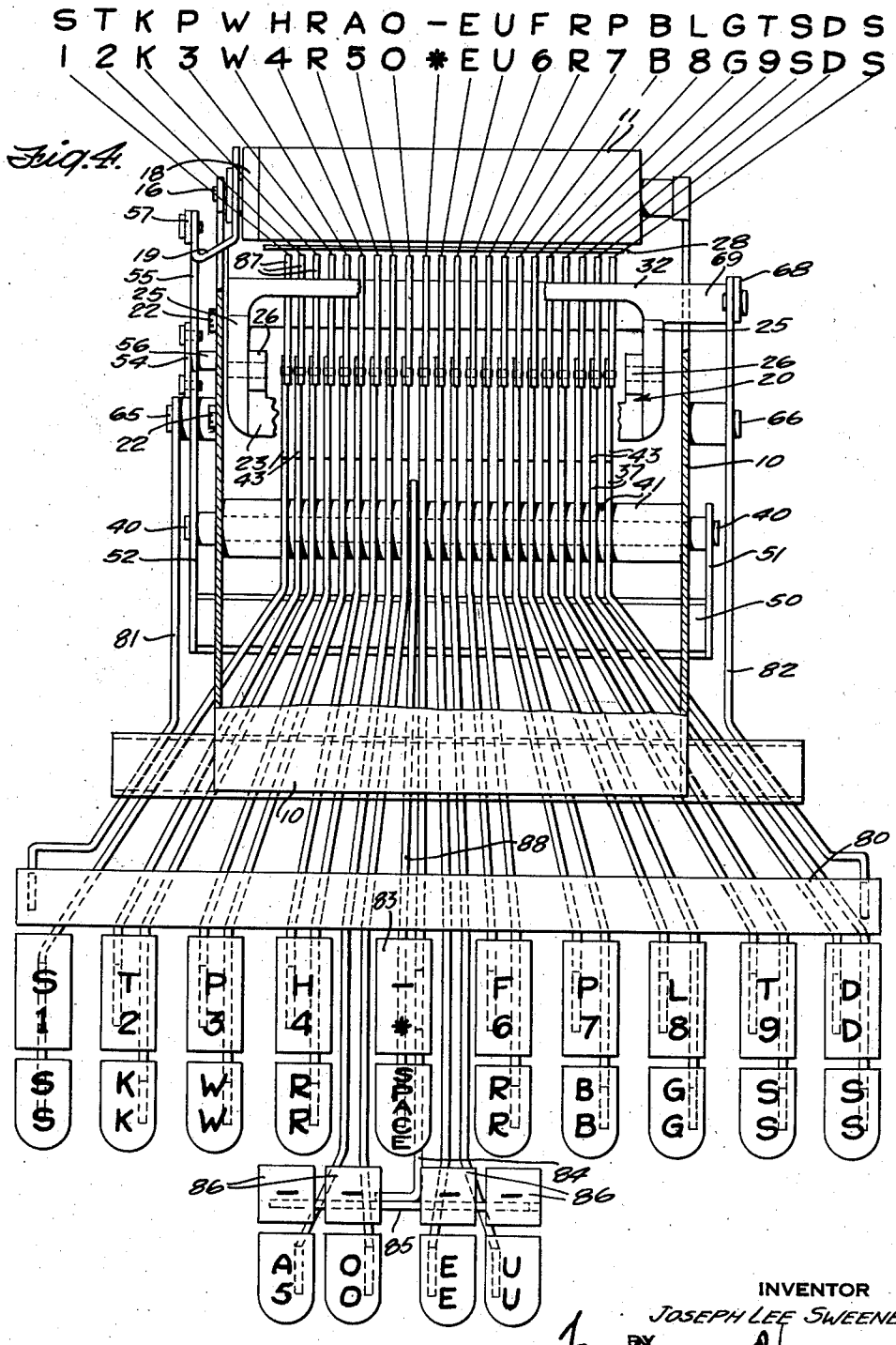


INVENTOR
JOSEPH LEE SWEENEY
BY
ATTORNEY

May 7, 1946. J. L. SWEENEY 2,399,769

SHORTHAND TYPEWRITING MACHINE

Filed March 5, 1941 8 Sheets-Sheet 4

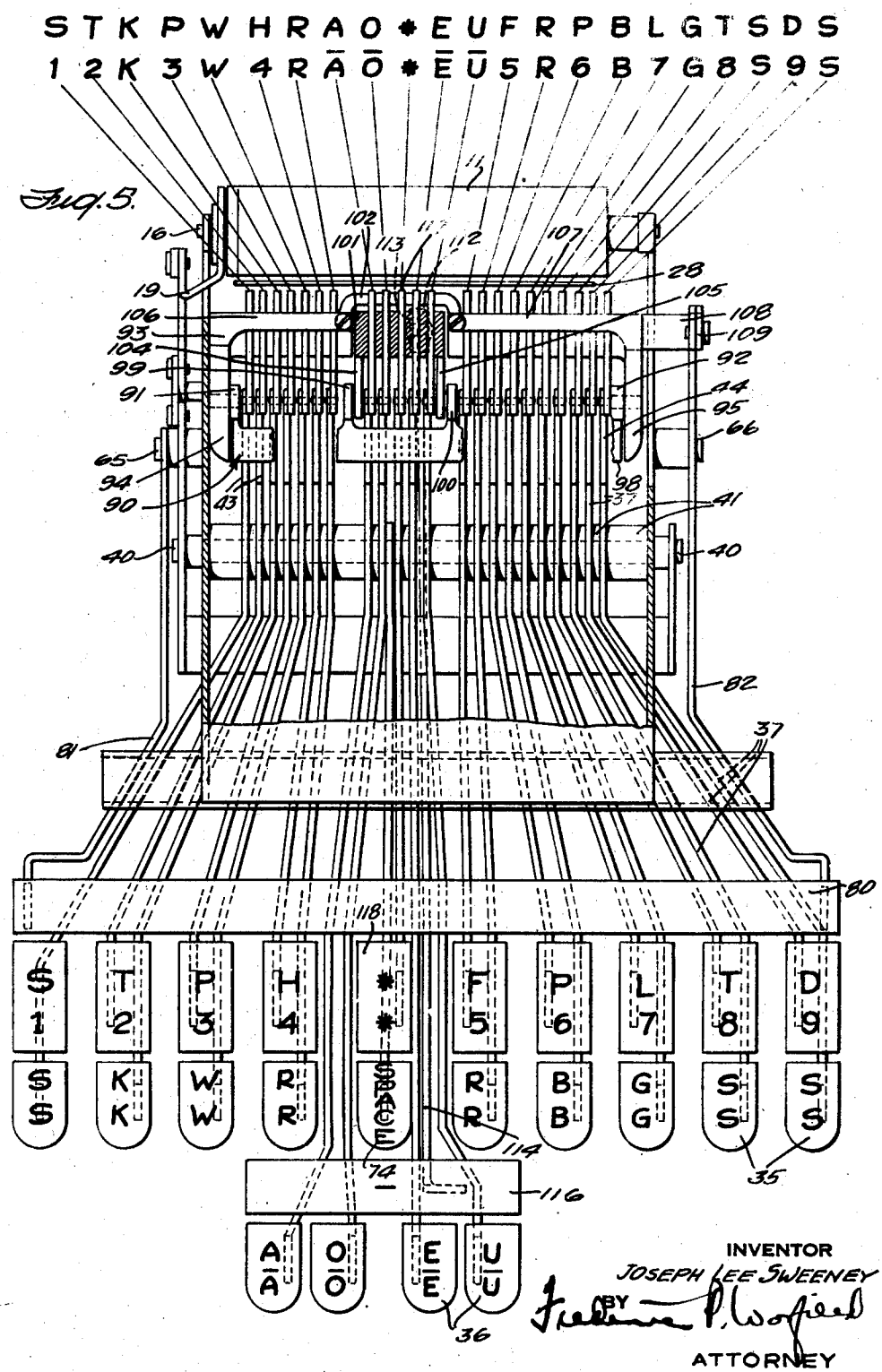


INVENTOR
JOSEPH LEE SWEENEY
BY
Frederick P. Wolfard
ATTORNEY

May 7, 1946. J. L. SWEENEY 2,399,769

SHORTHAND TYPEWRITING MACHINE

Filed March 5, 1941 8 Sheets-Sheet 5



INVENTOR
JOSEPH LEE SWEENEY
BY Frederick P. Warfield
ATTORNEY

May 7, 1946. J. L. SWEENEY 2,399,769

SHORTHAND TYPEWRITING MACHINE

Filed March 5, 1941 8 Sheets-Sheet 6

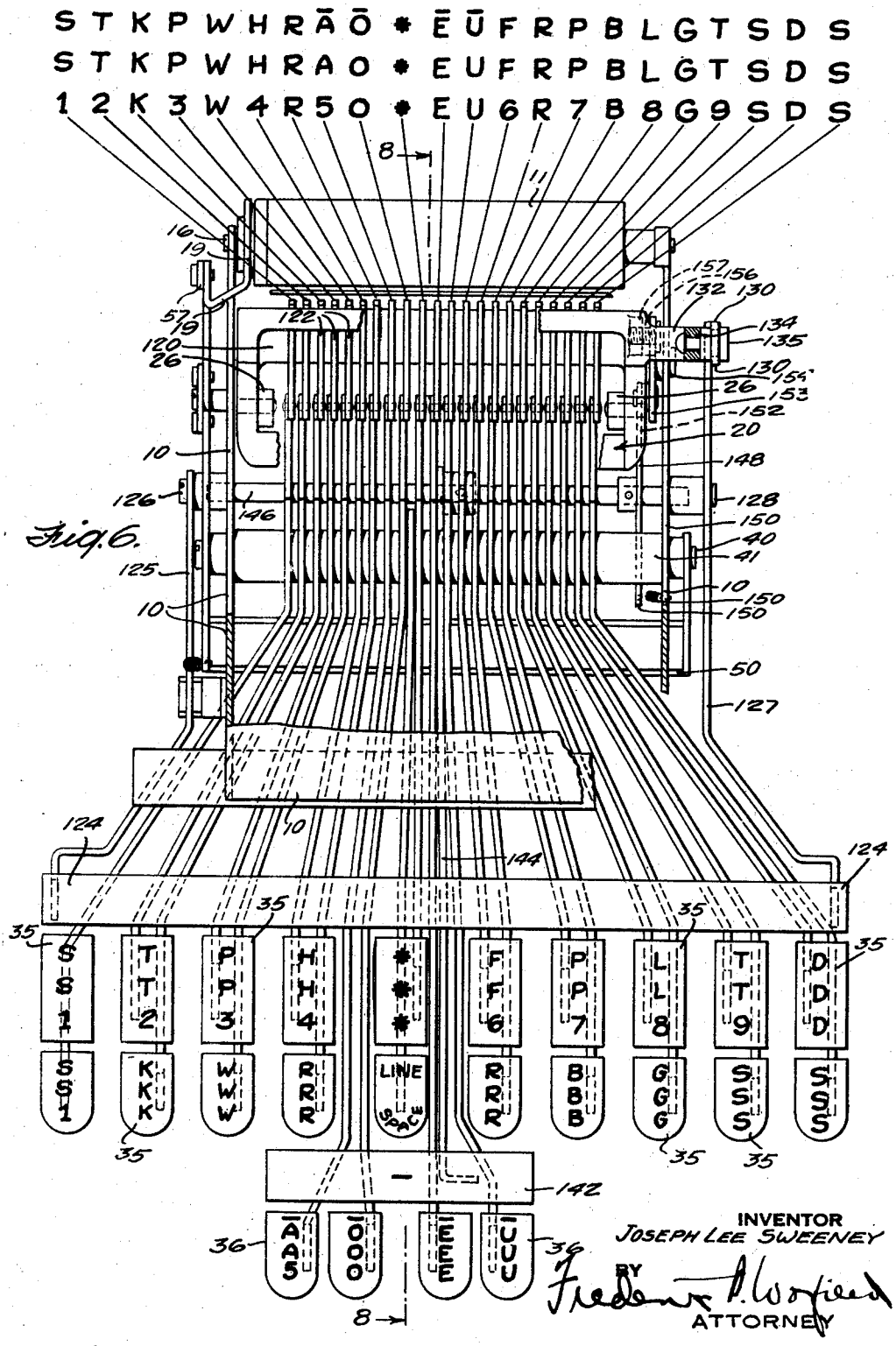
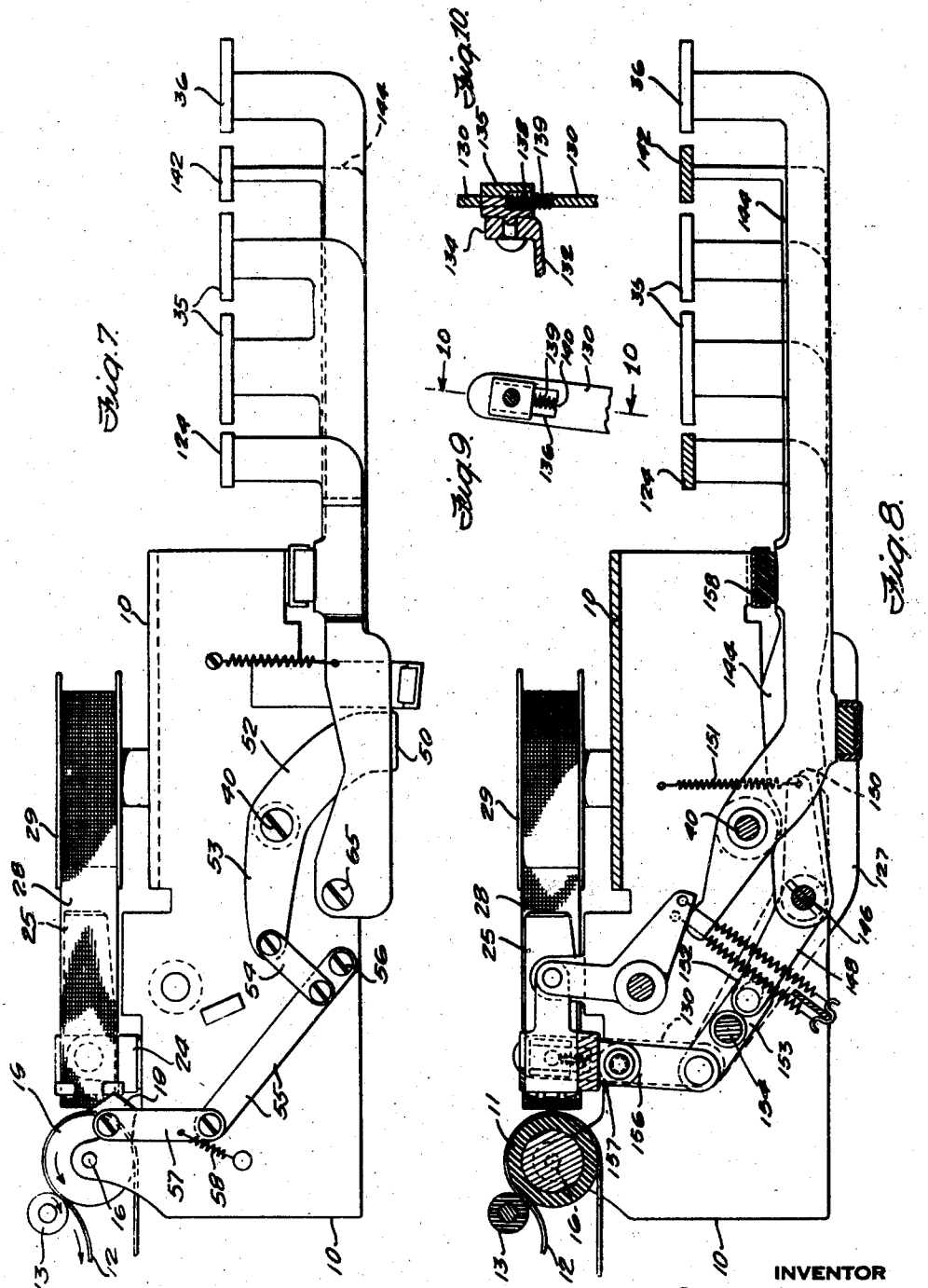


Fig. 6.

May 7, 1946. J. L. SWEENEY 2,399,769

SHORTHAND TYPEWRITING MACHINE

Filed March 5, 1941 8 Sheets-Sheet 7



INVENTOR
JOSEPH LEE SWEENEY
BY
Fredric P. Warfield
ATTORNEY

May 7, 1946. J. L. SWEENEY 2,399,769

SHORTHAND TYPEWRITING MACHINE

Filed March 5, 1941 8 Sheets-Sheet 8

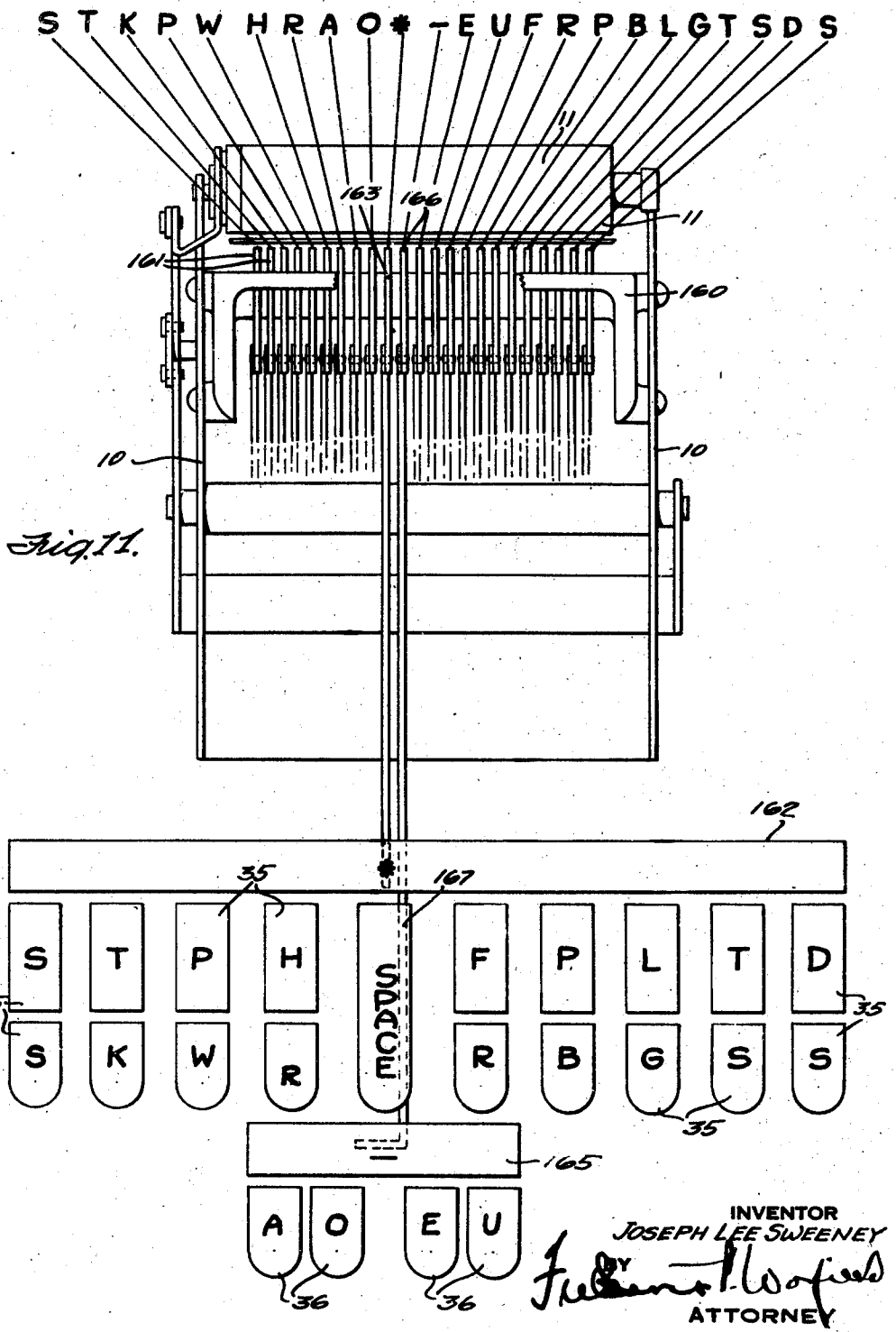


Fig. 11.

Patented May 7, 1946

2,399,769

UNITED STATES PATENT OFFICE

2,399,769

SHORTHAND TYPEWRITING MACHINE

Joseph Lee Sweeney, Jackson Heights, N. Y.

Application March 5, 1941, Serial No. 381,774

7 Claims. (Cl. 197—9)

This invention relates to shorthand typewriting machines by means of which syllables or words may be represented on successive lines on a paper strip by one or more type characters printed simultaneously on each line.

In shorthand typewriting machines which are now in general use, as for instance the stenotype machine, there is provided a plurality of keys representing consonantal characters arranged in a double row across the keyboard to be operated by the fingers of both hands and a plurality of keys at the front of the keyboard representing vowel characters to be operated by the thumbs. All of the consonantal characters are not included, certain ones being represented by combinations of certain others in accordance with the code used. A shift key is provided to shift the type bars so that numerals may be printed when this shift key is operated with certain of the consonantal keys. There is no means to differentiate between variations of vowel sounds, the transcriber depending on the context of the subject matter (and his memory, if he also did the recording) to reproduce the proper word.

There are many variations of vowel sounds in the English language which, if they were all to be recorded, would require a complicated keyboard arrangement. Since it is desirable to operate the vowel keys with the thumbs, and an operator has only two thumbs, complication of the vowel keys would greatly reduce the speed of operation. It is for this reason that machines now used for shorthand recording have only four of the ordinary vowel characters which, in the stenotype machine, are "A," "O," "E," and "U" arranged to print in the order given. With these four vowels, double "O" is represented by striking "A" and "O" together and "I" is represented by striking "E" and "U" together.

Certain words in the English language are pronounced alike but have different spellings and meanings, such as "pear," "pair," and "pare." In any shorthand system, such words are recorded alike and can be differentiated only by the context of the subject matter. But there are many hundreds of pairs of words which have different meanings and spellings and which are not pronounced alike but which are printed on the stenotype machine exactly the same. For example, "hat" and "hate" are recorded HAT; "head" and "heed" are recorded as HED; "rob" and "robe" are recorded as ROB; "strip and "stripe" are recorded as STREUP (EU for I); "a cut" and "acute" are recorded in two strokes as A KUT (on two different lines); "tub" and "tube" are recorded as TUB; "sell" and "seal" are recorded SEL. The words just quoted, while they can be distinguished by the context, give rise to inconvenience and delay in transcribing the printed notes because the transcriber must stop and think whenever one is encountered. I term such words "minor conflicts." There are, however, many words which I class as major conflicts, because the context may not indicate at all which of the two words is meant, making the accuracy of the transcribed material entirely dependent on the guess of the transcriber, or on his memory if he also did the recording. Such words are, for example, "bit" and "bite" which would be printed BIT; "ball" and "bale" which would be printed BAL; "best" and "beast" which would be printed BEST; "cap" and "cape" which would be printed KAP; "lick" and "like" which would be printed LIK.

Also, there are many combinations of words and prefixes which conflict because no method is provided to distinguish between the two sounds of the same vowel in different words. For instance, the prefix "non" and the word "known" would be printed the same. "Non-abstainer" cannot therefore be distinguished from "known abstainer"; "non-believer" from "known believer"; "non-conductor" from "known conductor," etc. When it is realized that the words in these pairs have substantially opposite meanings, the difficulty of making an accurate transcript will be appreciated.

The necessity for using the context to determine certain vowel variations is a serious drawback to speed in transcribing notes recorded on the paper strip of the shorthand machine, as it requires the transcriber to hesitate and think before typing the word, and, as has been pointed out above, in some instances, it is impossible to type the proper word unless the memory of the operator is sufficient to supply the correct vowel sound and the operator is also transcribing.

It is therefore one of the objects of the invention to provide a shorthand typewriting machine with a simple means for differentiating between certain vowel sounds, so that the transcriber in the vast majority of cases, will not have to consider the context of the subject matter in order to make an accurate reproduction of the code record.

Another object of the invention is to provide a shorthand typewriting machine as defined in the last paragraph which can be operated at a speed at least equal to or greater than machines of the prior art.

Another object of the invention is to provide a shorthand typewriting machine with means to differentiate long vowel sounds from other vowel sounds.

A further object of the invention is to provide a shorthand typewriting machine as defined in the above paragraph with a keyboard so slightly differing from the standard keyboard as to permit a skilled operator to learn to use it in a few minutes.

Another object of the invention is to provide a shorthand typewriting machine on which vowel sounds may be differentiated without in any way modifying the operation of the consonantal keys and associated mechanism.

Still another object of the invention is to provide a simple means for producing certain vowel distinctions which may be incorporated in a standard shorthand typewriting machine by minor changes in the mechanism without altering the general construction or operation of the machine.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the constructions hereinafter set forth, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a shorthand typewriting machine embodying one form of the invention and showing the casing removed and parts of the frame broken away to better disclose the mechanism;

Fig. 2 is a side elevational view of the machine of Fig. 1, with certain parts broken away showing the strip feeding device and the shift mechanism;

Fig. 3 is a sectional side view of the same machine taken on the line 3—3 of Fig. 1;

Fig. 4 is a plan view of a shorthand typewriting machine similar to the machine of Fig. 1 illustrating a modified form of the invention;

Fig. 5 is a plan view of a shorthand typewriting machine illustrating another modified form of the invention;

Fig. 6 is a plan view of a shorthand typewriting machine showing a still further modified form of the invention;

Fig. 7 is a side elevational view of the machine of Fig. 6;

Fig. 8 is a sectional side elevational view of the same machine taken on the line 8—8 of Fig. 6;

Figs. 9 and 10 are a side view and sectional view respectively of a yielding connection in the shift mechanism of the machine, the section of Fig. 10 being taken on the line 10—10 of Fig. 9; and

Fig. 11 is a fragmentary plan view of a single case machine incorporating the invention.

The present invention is based on my discovery that the only serious conflict between words of the English language with respect to variations in vowel sounds comes between the long vowel sound on the one hand and some other sound variation of the same vowel on the other. For instance, "ale" and "all"; "ate" and "at"; "snipe" and "snip"; "cute" and "cut"; "bate" and "bat"; "soak" and "sock"; and many other words, as has already been stated, cannot be distinguished as recorded on the standard shorthand machine except by the context of the subject matter, and certain other words cannot always be distinguised even when the subject matter is known. If, however, a means is provided to identify the long vowel sounds in words as they are recorded, it then becomes easy to avert any misreading; for with only very rare exceptions a long vowel sound occurs in one word of every pair of words now in conflict. A single exception may be noted in the case of the words "tongue" and "tong," in neither of which is a long vowel heard; but here the conflict is quite simply resolved in another way by writing TUNG for "tongue"; TONG for "tong."

In English, a few words that are pronounced alike have different meanings and are usually spelled differently. For example, "lead" (metal) and "led"; "red" and "read" (preterit); "bread" and "bred," etc. Such words are written alike in stenotypy and are intended to be distinguishable only by definition or context. These words are not exceptions to the rule stated in the last paragraph above because in them the vowel sounds are identical, not different; they are correctly recorded alike phonetically because they are correctly pronounced alike in English speech.

I accomplish the objects of the invention, therefore, by providing a simple means for designating on the record strip a long vowel sound whenever it is desired to record such a long vowel and, therefore, the necessity for the transcriber to follow the context as he or she types the printed code record in ordinary English is entirely eliminated and the speed of reproducing the recorded subject matter is greatly increased. The recording process is also made easier because there is less necessity for the operator to concentrate on the subject matter being recorded.

Several means for accomplishing the purposes of the invention have been illustrated in the drawings. Referring now to Figs. 1, 2, and 3, a standard stenotype machine is shown with my invention applied thereto. This machine comprises a frame 10 at the rear of which is rotatably mounted a platen 11 over which a strip of paper 12 is fed, a suitable roller 13 being used to hold the paper against the platen, so that the paper will move through the machine when the platen is rotated. A supply of the paper may be provided in zig-zag folds forming a stack 14 housed in a suitable compartment beneath the machine from which the paper may be drawn as the machine operates.

The platen is mounted upon a shaft 16 journaled in the frame 10 and is provided at the left end with a one-way clutch mechanism 18 operated by a lever 19 which extends outwardly from the side thereof and which is connected for operation in a manner to be hereinafter described. When the lever 19 is oscillated to oscillate the clutch 18, the platen 11 is caused to rotate intermittently in one direction carrying the paper strip with it.

Also mounted on frame 10 is a casting 20 having two side members 21 secured to the frame by screws 22 and a cross member 23 at the top which rigidly connects the side members. A comb 24, supported between side arms 25, is pivotally mounted in the casting 20, the arms 25 being pivoted to lugs 26 standing up from the side members 21. This comb supports in the slots thereof a plurality of type bars 27 in such a manner that they may slide towards and away from the platen 11. An inked ribbon 28 is guided between

the ends of the type bars and the platen 11 and moves up and down with the type, being arranged on spools 29 to move from one side of the machine to the other, slowly and intermittently, as the machine is operated.

Each type bar has a primary type 30 and a secondary type 31. A plate 32 holds the type bars in the comb 24 and limits their motion therein to a single direction with respect to the comb. When the comb is in its normal position, as shown in Fig. 3, the upper or primary type 30 will print when the type bar is moved towards the platen, causing the ribbon to press against the paper. However, means is provided to shift the comb 24 upwardly about the pivots 26, so that, in this position, the lower or secondary type 31 on each type bar will print when the type bar is moved to press the ribbon against the paper. This shift mechanism will be described later.

In order to cause the type bars to move against the platen, a plurality of keys 35 and 36 are provided, these keys being mounted on operating bars 37 which are all pivotally mounted on a shaft 40, supported in the frame 10. The rear ends of the bars 37 are substantially parallel and are held in position on the shaft by spacers 41. These bars are relatively close together where they are supported on the shaft 40, but are bent just forwardly of the shaft at different angles to fan outwardly, thus providing an extended keyboard. The rear ends of the bars 37 tilt upwardly a short distance beyond the shaft 40 and terminate in cams 42. Each of these cams bears against the lower arm 43 of one of a plurality of bell crank levers 44 mounted on a shaft 45 which is supported in the bracket 20 between the two sides 21. The upper arm 46 of each of the bell crank levers 44 is pivotally connected to the forward end of one of the type bars 27.

When one of the keys 35 and 36 is depressed, the bar upon which it is mounted is rotated about the shaft 40 in a clockwise direction, as viewed in Figs. 2 and 3, thus causing the cam 42 to move upwardly, pushing the arm 43 of the associated bell crank lever 44. This causes the upper arm 46 of the bell crank lever to move rearwardly, thus pushing the associated type bar towards the platen and causing the primary type 30 thereon to press the ribbon 28 against the paper 12.

A channel member 50 is mounted on a pair of levers 51 and 52 which are pivoted on the shaft 40 on opposite outer sides of the frame 10. The lever 52 on the left side is extended beyond the shaft 40, and its extended end 53 is connected by means of a link 54 to a toggle mechanism which operates the arm 19 of the feeding clutch 18. This toggle mechanism includes a lever 55 which has its lower end pivoted at 56 to the frame 10 and a lever 57 which is pivotally connected between the other end of the lever 55 and the clutch operating arm 19. The link 54 connects the end 53 of the lever 52 with the lever 55 at a point adjacent the pivot 56.

Whenever any one of the keys 35 and 36 is depressed, the corresponding bar 37 depresses the channel 50, thus operating the lever 52 and toggle 55 and 57, and moving the clutch mechanism 18 to cause rotation of the platen 11. The arrangement is such that although the platen rotates when the channel member 50 is moved, as described above, the movement of the platen ceases prior to the striking of the type against the ribbon. A spring 58 attached between the frame and lower end of the toggle lever 57 returns the toggle mechanism to the normal position shown in Fig. 2.

The individual type bars are caused to return to their normal position by springs 60, one end of each of which is attached to the arm 43 of each bell crank lever 44, the other end of the spring being attached to a cross member 61 which is connected between two depending arms 62 on the sides 21 of the casting 20. Adjacent springs are staggered to prevent them from interfering in operation.

In order to shift the type bar assembly to its upper position, a pair of bars 63 and 64 are provided, one on each side of the frame 10 of the machine, these bars being pivoted to the frame at 65 and 66 respectively, the pivot points being to the rear and slightly below the shaft 40. The bar 64 is extended beyond the pivot 66 and its rearmost end is connected by means of a link 68 to a lug 69 extending out from the comb 24. Rotation of the bar 64 about the pivot 66 will cause the link 68 to raise the rear end of the comb 24 and the type bar assembly for printing the lower or secondary row of types 31 provided on the type bars.

In the standard stenotype machine, this shift mechanism is operated by a long key which extends clear across the top of the keyboard, so that it may be depressed with any one of the keys in the upper row of keys. In order to perform the objects of the present invention, I extend the arms 63 and 64 forwardly of the machine, around the two rear rows of keys, and connect the forward ends to an elongated key 70 which extends partially across the front of the keyboard just behind the keys 36, the arrangement being such that any one of the keys 36 may be depressed simultaneously with the elongated key 70 which operates the shift mechanism.

I also provide a long bar key 72 just to the rear of the rear row of keys 35, but instead of this key being connected to the shift mechanism, as it is in the standard machine, I connect it directly to the operating bar 73 at the center, which in the standard machine, also support the asterisk key. And I then increase the size of the space key 74 so that it occupies the space of two keys from front to back.

In the standard stenotype machine, there are a plurality of keys representing certain consonants and four keys representing the vowels "A," "O," "E," and "U." All of the consonants in the alphabet are not provided, the machine being used with a code system in which certain combinations of consonants represent certain consonantal sounds, either at the beginning or ending of the word or syllable. Similarly, as has been pointed out above, certain combinations of vowels are used to represent other vowel sounds, as, for instance, "AO" to represent "OO" and "EU" to represent "I." In the present invention, I have used substantially the same consonantal type characters with a similar arrangement of keys and also the same arrangement of vowel types and vowel keys. Thus the keys 35 which form a double row at the rear of the keyboard are the consonant keys and the four keys 36 at the front of the keyboard represent the vowels "A," "O," "E," and "U."

The consonant keys 35 and vowel keys 36 are preferably provided entirely blank to encourage the operator to learn the operation of the machine by touch, but in the drawings, I have shown the letters and other characters printed on the keys to make the drawings more understandable. In each case the primary character is shown printed above the secondary character.

In the standard stenotype machine, the lower or secondary type on certain type bars is a numeral, these types being arranged so that keys of the rear row of keys may be depressed simultaneously with the shift bar to print the numerals. In order to carry out my invention, I have removed the numerals from the secondary row of types and replaced them by duplicates of the primary types, except for the vowels "A," "O," "E," and "U." The secondary types on the vowel type bars, I have replaced with the same vowels, each with an addition of a diacritical mark above it, as, for instance, "Ā," "Ō," "Ē," and "Ū." The entire arrangement of type characters as they would be printed from left to right of the paper is shown immediately above Fig. 1 of the drawings. The upper row represents the primary characters and the lower row the secondary characters which print when the shift key is depressed.

With this arrangement of keys, types, and operating mechanism, the vowels "A," "O," "E," and "U" may be printed by simply depressing the vowel keys 36. If, however, it is desired to record a long vowel sound, the desired vowel key is depressed together with the elongated key 70. The key 70 operates the shift mechanism, as already described, and the secondary type is printed which is the vowel with a diacritical mark above it. If any of the consonant keys are depressed at the same time that the shift mechanism is operated, the consonants which would ordinarily be recorded by the depression of those particular consonant keys, are printed, because the lower or secondary type on each consonant type bar is identical with the primary type.

The bar key 72 is connected by means of the operating bar 73 to a type bar 71 containing an asterisk as a primary type which is duplicated for the secondary type. Therefore, whenever the key 72 is depressed, an asterisk will be printed regardless of whether the shift mechanism is operated or not. Since I have removed all numerals from the types, I desire to represent a numeral by depressing one of the keys of the upper row of consonant keys together with the bar key 72 which prints an asterisk. The numeral "1" would, therefore, be represented by printing an "S" followed by an asterisk, the numeral "2" by a "T" followed by an asterisk, the numeral "3" by a "P" followed by an asterisk, the numeral "4" by an "H" followed by asterisk, the numeral "5" by an "F" preceded by an asterisk (because the asterisk prints in the center of the paper strip and the "F" towards the right), the numeral "6" by "P" preceded by an asterisk, the numeral "7" by "L" preceded by an asterisk, the numeral "8" by "T" preceded by an asterisk, and the numeral "9" by "D" preceded by an asterisk.

It will be seen that with the arrangement illustrated in Figs. 1, 2, and 3, the standard mechanism of the stenotype machine is used with the exception that an additional elongated key 70 is provided just back of the vowel keys which elongated key is connected to the shift mechanism, and the bar key at the rear is arranged to print the asterisk. Certain minor changes are also made in the type. The only difference in operation over the standard stenotype machine is that the numerals are represented by a consonant followed or preceded by an asterisk, as the case may be, while the machine has the additional highly desirable advantage that it can differentiate the long vowel sounds from other vowel sounds.

In using the embodiment of the invention disclosed in Figs. 1 to 3 inclusive, the operator, skilled in the use of a standard stenotype machine, is confronted with substantially the same keyboard with the exception of the elongated key just to the rear of the vowel keys. He or she need only remember that numerals are represented by the upper row of the consonantal keys recorded simultaneously with an asterisk and that the long vowel sounds may be recorded by simply moving the thumbs slightly towards the rear of the machine so that they can strike both vowel key and the elongated key.

In Fig. 4, I have shown my invention applied to a standard stenotype machine in a somewhat modified form. In this figure, the various parts of the machine, with the exception of the keyboard and certain of the operating parts connected thereto, are the same as those shown in Figs. 1, 2, and 3 and carry the same reference characters. However, the bar key 80 which corresponds to the bar key 72 of Fig. 1, is now arranged to operate the shift mechanism. For this purpose, operating bars 81 and 82, similar to bars 63 and 64 of Fig. 1, are mounted on the pivots 65 and 66 respectively, operating bar 82 being extended to the rear and connected to the shift mechanism. The key 83, which corresponds to the asterisk key in the standard machine, is mounted on the operating bar 84 which is extended forwardly of the machine and has mounted on the forward end thereof a cross bar 85 which extends across in back of the vowel keys and carries a plurality of small keys 86, one for each of the vowel keys.

The type bars 87 in this instance are provided with two types, the primary and secondary rows being indicated above Fig. 4. In this case, the numerals appear on the secondary row of types and are produced when the type bar assembly is shifted by depressing the bar key 80 and certain of the upper row of consonantal keys are simultaneously depressed with it. This is true with the exception of the numeral 5 which is recorded by depressing the "A" key simultaneously with the shift key 80. The type bar 88 which is connected to the asterisk key and also to the elongated bar 85 carries the asterisk as the secondary type, while the primary type is a dash, as shown in the representation of the types above the Fig. 4, which is used to represent a diacritical mark to indicate that a particular vowel has a long sound.

In using this particular form of the invention, the operator will operate the consonant keys in a normal manner, and when wishing to record numerals, will depress one of the keys in the upper row together with the shift key 80, or in the case of the numeral 5, the "A" key with the shift key 80. However, when it is desired to indicate that the vowel sound is long, he or she will depress the desired vowel key together with the small key 85 in back of it, whereupon the diacritical mark, which is the primary type on the type bar 88, will be printed. Thus "long A" will be represented by "A" followed by a dash, "long O" by "O" followed by a dash, "long E" by "E" preceded by a dash, "long U" by "U" preceded by a dash, and "long I" by "Eu" preceded by a dash.

When it is desired to print an asterisk, the asterisk key 83 is depressed (which also depresses the small keys 85) and the shift key 80 is de-

pressed simultaneously with it which shifts the type bar assembly so that the secondary type on the type bar 88, which is the asterisk, will be printed.

In changing a standard stenotype machine to perform the function of my invention in accordance with this particular form, I have only to change the primary type on the type bar 88 and add the keys 86 which are connected to the key 83. Of course, a single elongated key, similar to the key 70 of Fig. 1, may be used in place of the keys 86.

In Fig. 5, I have shown a somewhat different arrangement of the operating mechanism of the machine to accomplish the purpose of the invention. In this arrangement, the type bars are divided into two type bar assemblies which shift independently. One of these assemblies includes all of the consonantal types, while the other one includes the vowel types and the asterisk type.

A bracket 90 is provided, which is similar to the casting 20 of Fig. 1, for supporting the two type bar assemblies. This bracket has side bearings 91 and 92 for pivotally mounting the comb 93 which is provided with side members 94 and 95 for making the pivotal attachment, while the cross member 98, which forms part of the bracket 90 also carries two bearings 99 and 100 for supporting a smaller independent comb 101 which carries the other type bar assembly. The comb 93 is offset downwardly at the center by a U-shaped member 102, so that the two side sections of the comb will be rigidly connected to each other, but the whole assembly can move independently of the other type bar assembly, represented by the comb 101. The comb 101 has side extensions 104 and 105, the forward ends of which are pivoted to the bearings 99 and 100.

Plates 106 and 107 are provided on top of the comb 93 and hold the type bars carried thereby in position, while another plate, (not shown), is provided to hold the type bars in position in the comb 101.

The comb 93 may be rotated about its pivots by means of an arm 108 which extends out at the right side thereof and which is connected by means of the link 109 to the extended end of the shift lever 82. On the forward end of the latter is mounted the shift key 80, which is similar to that shown in Fig. 4. The other end of the shift key 80 is supported upon an operating arm 81. By depressing the shift key 80, the arm 82 will rotate about the pivot 66, thus raising the link 109 and the comb 93 to raise the type bars carried by that comb into position for printing the secondary row of types. At the same time this movement will be entirely independent of the comb 101 and its type bars, because of the offset connector 102 which connects the two sides of the comb 93.

The comb 101 has an ear 112 which extends downwardly from the bottom thereof and to which is pivotally connected a link 113 which in turn pivotally connects to the extended end of an operating bar 114, similar to the bars 37 all of which are pivoted on the shaft 40. The forward end of the bar 114 is provided with an elongated key 116 which is positioned just to the rear of the vowel keys 36. By depressing the elongated key 116, the operating bar 114 is rocked about the shaft 40 to raise the link 113 and comb 101 so that the type bars carried by the latter are caused to assume their upper position for printing the secondary types carried by the type bars.

The arrangement of types on the type bars is indicated above Fig. 5. The type bars carrying the vowels have the letters "A," "O," "E," and "U" carried as primary types, while these same bars carry respectively the designations "Ā," "Ō," "Ē," and "Ū" as secondary types. The type bar 117, carrying the asterisk, which is connected to the asterisk key 118, carries the asterisk character for both primary and secondary types, so that the asterisk will be printed regardless of whether the vowel type bar assembly is shifted or not.

With this arrangement, the consonant keys of the machine are operated the same as for the standard machine, the shift key 80 being used simultaneously with certain of the consonantal keys to produce numerals, as will be evident from an inspection of the type arrangement above Fig. 5. (A slight exception is that numerals 5, 6, 7, 8, and 9 are all at the right of the vowels.) If, however, it is desired to print a long vowel sound, the elongated key 116 is depressed with one of the vowel keys in a similar manner to the arrangement already described, whereupon the vowel type bar assembly is raised and the secondary type which includes the diacritical mark above the letter is printed. The vowel shift mechanism is entirely independent of the consonant shift mechanism and can be used regardless of whether or not the latter is operated.

It will be noted that the arrangement just described and shown in Fig. 5 requires somewhat of an alteration of the mechanism, although the keyboard has the same general appearance as that of the preceding embodiments of the invention and operates in substantially the same way.

In Fig. 6 still another embodiment of the invention is shown with a double shift mechanism. In this arrangement the frame, platen, strip feeding mechanism, and keyboard are substantially the same as those described in connection with the other figures. However, the bracket 20 supports a comb 120 which is pivoted on the bearings 26 to rotate down, as well as up, with respect to its normal position, as shown in Figs. 6, 7, and 8. The type bars 122 supported in the comb 120 carry three types, each bar having primary, secondary, and tertiary types as indicated above in Fig. 6.

An elongated key 124 positioned just to the rear of the rearmost row of consonant keys 35 is operatively associated with the comb 120 so as to shift it to its upper or tertiary position when the key 124 is depressed. To this end the left end of the key is mounted on the bar 125 which is pivoted at 126 on the frame 10 of the machine. The right end of the key 124 is mounted on an operating bar 127 which is pivoted at 128 to the right side of the frame 10. The bar 127 extends beyond the pivot 128 and has an up-turned end which is pivotally connected to a link 130, the upper end of the link being connected by a yielding connection to an arm 132 extending out from the comb 120, so that depression of the shift key 124 will rotate the bar 127 about its pivot 128, to raise the rear end thereof and also the link 130 and lift the comb 120 carrying the type bars 122.

The connection between the link 130 and the arm 132 is made yielding to permit the type bar assembly to be lowered without lowering the link 130, and to this end the arm 132 is provided with an up-turned lug 134 at its outer end which is pivotally connected to a split block 135. The block 135 is made in two parts with one part having a central portion of reduced cross sec-

tion so as to fit within a slot 136 provided in the upper end of the link 130. The arrangement is such that the block 135 is slidable within the slot but is prevented from falling out by enlarged portions on each side of the link 130. The block 135 is also provided with a central socket 138 in which is fitted a spring 139 which is positioned within the slot 136 and which bears against the lower end of the slot where it is held in place by a small lug 140. The spring 139 thus urges the block 135 to the upper-most end of the slot 136. With this arrangement, when the link 130 is moved upwardly, the arm 132 is also moved upwardly, but the arm 132 can be lowered against the tension of the spring 139 without moving the link 130.

The elongated key 142 which is positioned just to the rear of the vowel keys 36 at the forward end of the keyboard is used to control the downward shift of the comb 120 and type bar assembly. To this end the key 142 is mounted on an operating bar 144 which extends beneath the shaft 40 and terminates at a shaft 146 mounted in the frame in line with the pivots 126 and 128. The bar 144 is fixed to the shaft 146, so as to cause it to rotate when the key 142 is depressed. A bell crank 148 is also mounted on the shaft 146 adjacent the right side of the machine and is fixed to the shaft by suitable means so that it rotates with it. The forward end 150 of the bell crank 148 is urged upwardly by a spring 151 which is attached to a portion of the frame 10. The rearward end 152 of the bell crank 148 is pivotally connected to one end of a short lever 153 which is pivoted to the frame at 154. The pivotal connection between the end 152 of the bell crank and the lever 153 is arranged as a pin and slot connection so as to permit rotation of both levers 153 and 148 about their respective pivots 154 and 146. The other end of the lever 153 is pivotally connected to a link 156 which is in turn pivotally connected to a depending lug 157 formed integral with the lower surface of the comb 120.

When the elongated key 142 is depressed, the shaft 146 is rotated in a clockwise direction as viewed in Fig. 8 which rotates the bell crank 148 in the same direction and, therefore, raises the end 152 of the bell crank. This rotates the lever 153 in a counter clockwise direction about its pivot 154, thus pulling the link 156 downwardly to lower the type bar assembly carried by the comb 120.

In order to lower the type bar assembly, the tendency will be for the operating bar 127 to be rotated in a counterclockwise direction about the pivot 128 to raise the shift key 124. However, all of the keys are prevented from being raised by the cushioned stop 158 which is provided for this purpose and, therefore, the type bar assembly can only be lowered by compressing the spring 139 and permitting the block 135 to move downwardly in link 130 without moving the link. Movement of the type bar assembly downwardly, therefore, is against the tension of the spring 139 in addition to the spring 151 against the tension of which the bell crank 148 operates. However, the operating bar 144 carrying the shift key 142 is longer than the operating bars 125 and 127 carrying the shift key 124, so that there is enough additional leverage to overcome the additional spring tension and the two shift keys may offer substantially the same resistance to pressure.

The middle row of characters represented above Fig. 6 are those which are normally printed when the keys are depressed without depressing either of the shift keys 124 or 142. The upper row of characters print when all of the keys are depressed together with the shift key 142. It will be noted that the types on this upper row are similar to those of the second row with the exception that each of the vowel characters "A," "O," "E," and "U" has a dash above it. The lower row of type characters are those which are printed when the rear-most shift key 124 is depressed with the other keys, and this row contains the numerals similar to some of the modifications already described. The numerals are, therefore, printed by depressing the upper row of the consonant keys 35 together with the rear shift key 124.

In using the embodiment of the machine as shown in Figs. 6, 7, 8, 9, and 10, the operator will print the consonants in the ordinary manner, using the rear-most shift key 124 to obtain numerals, as in forms already described. When it is desired to print a long vowel sound, the shift key 142 is depressed simultaneously with one or more of the vowel keys. It will thus be seen that the machine, as far as the keyboard is concerned, operates in the same manner as the embodiments of Figs. 4 and 5, although in this particular case, the whole type bar assembly shifts upward to print numerals and downward to print the long vowel sounds.

The embodiments of the invention described in connection with Figs. 1 to 10 inclusive involve the use of a double case typewriting machine with shift means to change the type from one set to another. In Fig. 11, I have shown another modification of the invention which uses the single case machine with no shifting mechanism. This machine comprises a comb 160 which is fixed in the frame 10 of the machine and which carries a plurality of type bars 161, arranged to move in the comb towards and away from the platen. The type bars are controlled by two rows of consonant keys 35 and four vowel keys 36 which are mounted on the operating bars, not shown in this figure, but similar to the bars 37 shown in the previous figures.

An elongated key 162 is operatively connected with the type bar 163 carrying an asterisk, and this key extends across the rear of the keyboard so that it may be depressed with any of the consonant keys in the rear row. An elongated key 165 mounted just to the rear of the vowel keys 36 and long enough to be depressed simultaneously with any of these keys is operatively connected to a type bar 166 which carries the "dash" for the diacritical mark. A double key 167 at the center of the keyboard merely operates as a spacer and is not connected to any type bars.

The operation of this single case machine will be evident. The consonant keys are operated in the same manner as those of the other forms of the invention and numerals are designated by using the asterisk key 162 simultaneously with the keys of the rear row as in the case of the construction of Fig. 1. If it is desired to designate a long vowel sound, the desired vowel key is depressed together with the key 165 which produces the "dash" or diacritical mark together with the vowel.

From the above it will be seen that I have provided a simple means in a shorthand typewriting machine to distinguish long vowel sounds from other vowel sounds. Although I have shown sev-

eral different arrangements for accomplishing this result, it will be noted that all of these arrangements operate substantially the same so far as the keyboard is concerned. There are the same number of keys and the only difference over the standard stenotype machine in general use is that an elongated key is provided just back of the vowel keys which when pressed simultaneously with one of the vowel keys produces the long designation on the record strip.

As an example of the advantage ootained by my new arrangement, the following list of words is given. In the first two columns, pairs of words are given which would normally conflict. The third column shows the way both of these words would be recorded on a standard stenotype machine with respect to the vowel sound. The consonants for correct spelling have been given for clarity, although it will be understood that some of the consonants are printed on the machine in code symbols. The fourth column shows the way the second word of each pair would be recorded with my new invention as to vowel sounds, it being understood that with certain forms of my invention the diacritical mark shown above the letter would be at one side or the other, but in any case, it would be on the same printed line.

add	aid	AD	$\overline{A}$D
bat	bait	BAT	B$\overline{A}$T
can	cane	KAN	K$\overline{A}$N
dead	deed	DED	D$\overline{E}$D
err	ear	ER	$\overline{E}$R
far	fair	FAR	F$\overline{A}$R
gap	gape	GAP	G$\overline{A}$P
hell	heel	HEL	H$\overline{E}$L
ill	isle	IL	$\overline{I}$L
jut	jute	JUT	J$\overline{U}$T
kit	kite	KIT	K$\overline{I}$T
lop	lope	LOP	L$\overline{O}$P
mop	mope	MOP	M$\overline{O}$P
nut	newt	NUT	N$\overline{U}$T
on	own	ON	$\overline{O}$N

There are an extremely large number of words of this nature and the above have been given merely to illustrate the ease with which my present invention permits the operator of a shorthand typewriting machine to distinguish between these conflicting words. It will be evident that a great deal of time will be saved in transcribing the recorded sounds since the transcriber can tell instantly from the notes which word is meant without having to stop and study the context. Since these are words which occur constantly in the course of any use of the English language, it will be seen that the speed of transcription will be greatly increased by the use of my invention.

It will be evident that certain forms of my invention are particularly applicable to the standard machines now on the market, so that such a machine can easily be altered to accomplish the purpose of the invention at little expense and without any substantial change in the actual operation.

While in each of the forms of the invention illustrated, I have shown a "dash" to be used with the vowel to indicate the long vowel sounds, it is to be understood that any character might be used to designate the long vowel as long as such character is different from the vowel itself and its use would not cause confusion. The applied diacritical mark shown is perhaps preferable, being the one usually used for this purpose in phonetic spelling.

In Figs. 1, 5, 6, and 11, I have shown an elongated key for producing the diacritical mark when that key is depressed with any of the vowel keys, while in Fig. 4, I have shown that key broken up into four small units which are all mounted on the same operating bar and operate together regardless of which one is depressed. It will be understood that any of the elongated keys mentioned, including the one at the rear of the keyboard, might also be broken up in a similar manner to either improve the appearance or the operation of the machine. Any manner of defining one of these elongated keys in the claims is intended, therefore, to cover both of these arrangements.

The operation of the keyboard is so similar to that of the standard machine in any of the modifications shown that an operator can operate a machine equipped with my invention almost at once with substantially no practice. The invention, therefore, not only adds an extremely desirable feature to a shorthand typewriting machine but does it in such a way that an operator skilled in the use of the machines heretofore available will be able to use the invention without any difficulty.

Since certain changes may be made in the above construction and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which as a matter of language might be said to fall therebetween.

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

1. In a shorthand typewriting machine, a plurality of keys including keys representing vowels, said vowel keys being arranged in a row, an elongated key mounted adjacent said row of vowel keys so as to permit simultaneous operation of said elongated key with any one of said vowel keys by a single finger, means to print a vowel character when the key representing that vowel is depressed, and means including part of said last mentioned means to print a different representation of said vowel character when said elongated key is depressed simultaneously with said vowel key without modifying the printing caused by the action of said first mentioned keys which are not vowel keys, whereby a distinction between a long vowel sound and another sound of the same vowel may be made.

2. In a shorthand typewriting machine, a plurality of types for printing vowel representations, keys associated with said types to cause said types to print, an elongated key positioned so as to be operated simultaneously with any one of said vowel keys by a single finger, means to print one of said types when one of said vowel keys is depressed alone, and means including part of said last mentioned means to print a different vowel representation when said last mentioned vowel key is depressed simultaneously with said elongated key, whereby long vowels may be distinguished from other vowel sounds.

3. In a shorthand typewriting machine, a plurality of keys representing consonantal characters arranged in rows, a plurality of keys representing vowel characters arranged in a row, and

an additional key, type bars associated with said keys and mounted to be operated simultaneously by said keys, the type bars associated with said consonantly keys each having a type representing a consonantal character thereon, the type bars associated with said vowel keys, each having a type representing a vowel character thereon, and the type bar associated with said additional key having a type representing a diacritical mark thereon, said additional key being elongated and positioned adjacent said row of vowel keys so as to permit depression of said additional key simultaneously with any one of said vowel keys, whereby when one of said vowel keys is depressed without said additional key, an ordinary vowel character will be printed, and when said same vowel key is depressed simultaneously with said additional key, said ordinary vowel character will be printed together with said diacritical mark, a shift key mounted adjacent one of said rows of consonantal keys, means operatively associated with said shift key to change the position of said type bars when said shift key is depressed, each of said type bars having another type thereon which is adapted to print when the key associated with the type bar is depressed together with said shift key, certain of the type bars connected to said consonantal keys adjacent said shift key having types representing one consonant and one numeral, said type bar associated with said additional key having a type representing an additional character which is adapted to print when said additional key is depressed simultaneously with said shift key.

4. In a shorthand typewriting machine, a plurality of keys representing consonantal characters, a plurality of keys representing vowel characters, a plurality of type bars operatively associated with said consonantal keys, means to mount said type bars to permit simultaneous operation thereof when said consonantal keys are simultaneously depressed, a plurality of type bars operatively associated with said vowel keys, means to mount said last mentioned type bars so as to permit simultaneous operation thereof when said vowel keys are simultaneously depressed, a first shift key positioned adjacent said consonantal keys, means operatively associated with said first shift key to change the position of said consonantal type bars when said first shift key is depressed, a second shift key positioned adjacent said vowel keys, means operatively associated with said second shift key to change the position of said vowel type bars when said second shift key is depressed, a pair of types on each of said consonantal type bars, each of said types representing at least one consonantal character, a pair of types on each of said vowel type bars representing an ordinary vowel character and the same vowel character differentiated to represent the long vowel sound, whereby when one of said vowel keys is depressed without said second shift key, a vowel character will be printed, and when said same key is depressed simultaneously with said second shift key, a different representation of the same vowel character will be printed, the operation of the vowel keys and type bars being entirely independent of the operation of the consonantal keys and type bars.

5. In a shorthand typewriting machine having a keyboard on which the depressible keys are so arranged that those used for printing the consonants are intended to be struck with the fingers and those used for printing the vowels with the thumbs, the said vowel keys being near the middle of the keyboard and in front of the consonant keys, the improvement comprising an additional key so shaped and so positioned that it may be struck with a thumb in conjunction with any one or more of the said vowel keys, thereby causing an additional character to be printed with the said vowel or vowels to indicate the long sound thereof.

6. In a shorthand typewriting machine having a keyboard on which the depressible letter keys are so arranged that those used for printing the consonants are intended to be struck with the fingers, and those used for printing the vowels with the thumbs, the said vowel keys being near the middle of the keyboard and in front of the consonant keys, the improvement comprising an additional key so shaped and positioned that it may be struck with a thumb together with any one or more of the said vowel keys, thereby causing to be printed an additional character in conjunction with any one or more of the said vowel or vowels to indicate the long sound thereof, the action of this additional key having no effect upon the printing of any of the consonant keys.

7. In a shorthand typewriting machine of the kind having a plurality of consonant printing types, keys operatively connected to said types for actuating the same, vowel printing types, keys operatively connected to the vowel printing types for actuating them, and in which said keys form an elongated keyboard, with the keys so arranged that the consonant keys are intended to be struck by the fingers, and the vowel keys by the thumbs, the vowel keys being near the middle of the keyboard, in front of the consonant keys, the improvement comprising additional key means common to the vowel keys and arranged adjacent those keys, said key means being so positioned and of such shape that it may be struck by a thumb together with any one or more of said vowel keys, and means operatively connected to said additional key means for printing a long vowel indication whenever said key means is struck simultaneously with any one of said vowel representing keys.

JOSEPH LEE SWEENEY.