April 25, 1950 L. HOLMES, JR 2,505,046

KEYBOARD FOR MECHANICAL SHORTHAND WRITING MACHINES

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Fig. 3.

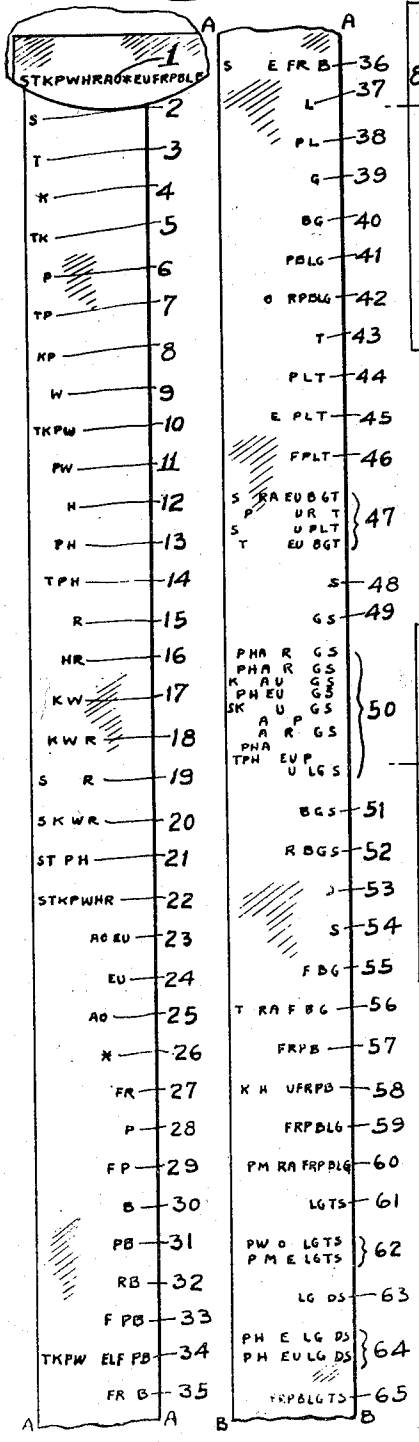


Fig. 1.

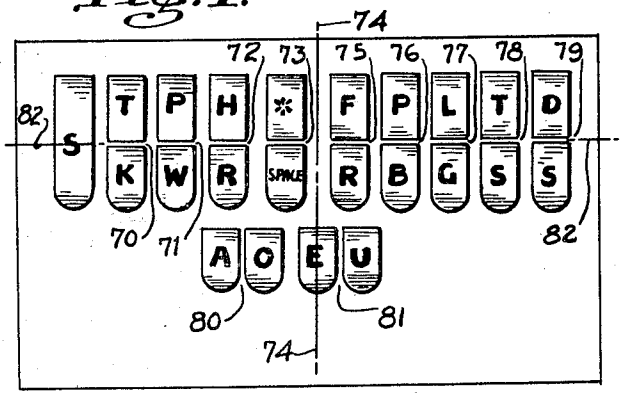
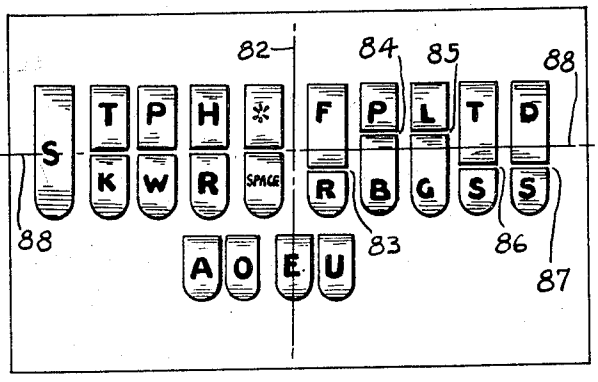


Fig. 2.



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KEYBOARD FOR MECHANICAL SHORTHAND WRITING MACHINES

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4 Claims. (Cl. 197—100)

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This invention relates to a keyboard for stenographic machines.

While many forms of such machines have been suggested in the past, only one form has survived in this country and is widely used. This is represented by the "Stenotype" and the "Stenograph" machines. These names are trade names for machines fundamentally the same in principle and manufactured by the Stenotype Company of Chicago, Illinois, and the Hedman Company of Chicago, Illinois, respectively.

Essentially these are modifications of the typewriter, carrying movable type actuated by keys which, when depressed, move the type bars so as to strike a platen over which a paper strip passes from a feeder roll. These machines are so well known that no further identification seems necessary.

This invention relates to a modification of the keyboard of these machines which facilitates their operation and permits of a substantial increase in speed and accuracy in their manipulation.

The object of my keyboard is to provide such an arrangement of the keys, which actuate the type bars of what is known in this art as the "final consonants" of the keyboard, to increase the facility of forming the necessary combinations of these final consonants which are required in printing the letters and letter combinations which are employed in this system of stenographic recording.

These final consonants and combinations thereof are struck by the fingers of the right hand. I have found that I may so arrange the spacing of the keys for such final consonants that I may strike these keys, in order to print these final consonants and their combinations, from a natural position of the right hand and with a minimum of finger manipulation. The right hand may be placed in its natural position on the keyboard, thus avoiding the twisting and curling of the fingers which act to reduce speed and introduce inaccuracies on manipulation.

I accomplish this result by providing one key to actuate each of the final consonants F, R, second P, B, L, G, second T, S, D, and final S type bars which move said letters to strike the tape as is provided in such machines. I arrange said keys in rows, each row containing a pair of keys so that each may be struck separately to actuate its own type bar. A separation space or line between the keys in each row is thus provided. The arrangement of these separation spaces or lines is such that if a median line is drawn across the right hand position of the keyboard, the separation space between the keys for the letters F and R, and between the keys of the letter T and the second S, and between the keys for the letter D and the final letter S would be below the median line (i. e., closest to the operator), while the separation space between the second P and the letter B and the separation space between the letters L and G would be above the median line (i. e., farthest away from the operator).

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By such an arrangement I obtain the advantages described above.

I have found, however, that the arrangement of the keys for the type bars which actuate the initial letter S and the type bars which actuate the initial consonant letters T, K, initial P, W, H, R, the asterisk, and the space bar as well as those for the letters A, O, E, and U should be left in their conventional position as on the present commercial machines. The best arrangement for the left hand is in its natural position to permit the striking of these keys singly and in combination, with a minimum distortion of the position of the fingers. This is in contradistinction to the operation with the right hand as described above.

My invention and its advantages will be further described in connection with the drawing, in which

Fig. 1 is a schematic illustration of the keyboard of the conventional commercial machine;

Fig. 2 is a schematic showing of the keyboard employing my invention; and

Fig. 3 is an illustration of the type and the type arrangement as formed by such a machine.

In these figures all parts showing the operating mechanism and the connections between the keys, type bars, and type are omitted, since they are conventional and form no part of my invention.

As will be seen, in both the conventional keyboard and in the keyboard of my invention the keys actuate type bars which actuate type which print on a paper tape of about two inches in width. The type is arranged so that each letter and the symbol "*" always strike the same position of the tape as the tape moves over the platen. The type is arranged to strike the letters and symbol in the sequence S T K P W H R A O * E U F R P B L G T S D S. The letter S appears three times and is referred to in the order of its appearance as the "initial S," the "second S," and the "final S." The letter P appears twice and is referred to in the order of its appearance as the "initial" and the "final" P. Likewise the letter T appears twice and is referred to in the order of its appearance as the "initial T" and the "final T." Also the letter R appears twice and is referred to in the order of its appearance as the "initial R" and the "final R."

In the conventional machine the keyboard, as it appears to the operator when he faces the keyboard, appears as shown in the schematic

drawing Fig. 1. The letters of course are not printed on the keys and are shown in the drawing for explanatory reasons only. As will be seen the keys are arranged in rows. The board is divided into the initial consonants on the left of the axis 74 operated by the left hand and the final consonants on the right of the axis 74 operated by the right hand.

The first row is composed of the initial letter S, and following are the pairs of the initial consonants, initial T, K, initial P, W, H, initial R, and the asterisk and space key. The first pair, initial T, K, is arranged with the initial letter T above the letter K, i. e., the letter T is farther away from the operator than is the letter K. In like manner the initial letter P is above the letter W, and the letter H above the initial letter R. Thus, the keys for initial T and K are separated by a space 70, the keys for initial P and W by a space 71, and the keys H and R by a space 72, and the keys for the asterisk and the "space" by a space 73. These pairs are on the left of the longitudinal axis 74 and are intended to be struck by the left hand.

In like manner the keys F, final R, final P, B, L, G, final T, second S, D, and final S are all positioned on the right hand side of the longitudinal axis 74 and are arranged in pairs as shown with F and final R one above the other and separated by a separation space 75; the key for the letter P above that of B separated by a separation space 76, the key for the letter L above that of G separated by a separation space 77, the key for letter final T above that for the second S separated by a separation space 78, and the key for the letter D above that for the final letter S separated by a separation space 79. These keys are adapted to be struck by the right hand.

In the lower row the key letters A and O are arranged in a pair separated by a separation space 80 and are arranged on the left hand side of the axis 74. The keys for letters E and U are arranged in a pair spaced from A and O, with the letter E on the axis 74 and U to the right of the letter E, separated by a separation space 81.

It will also be observed that the separation spaces 70, 71, 72, 73, 75, 76, 77, 78, and 79 are arranged in a line on the transverse axis 82.

In the form of the keyboard of my invention the keyboard on the left of the longitudinal axis 82, corresponding to 74 of Fig. 1, is the same as in the form shown in Fig. 1. The arrangement on the right of the longitudinal axis 82, Fig. 2, corresponding to 74 of Fig. 1, is, however, different. The separation space 83 between the keys for the letters F and final R and the separation space 86 between the letter final T and the second S and the separation space 87 between D and the final S are all below the median line 88, while the separation space 84 between the keys for the letters final P and B and the separation space 85 between the letters L and G are above the median line 88.

This median line is shown as on the transverse axis 88 corresponding to 82 of Fig. 1 and passing through the separation spaces between the left hand initial consonants which line up. However, it is not essential that this median line be coincident with the transverse axis although it is the preferred form.

It is preferred that the separation spaces 84 and 85 be in line and the separation spaces 83, 86, and 87 also be in line, and that the separation spaces 84 and 85 be as much above the axis 88 as are the separation spaces 83, 86 and 87 below that line. This distance of the separation spaces above and below the axis 88 is such as to permit easy reach by the fingers of the right hand when the hand is in its normal position on the keyboard. While such spaces and alignment are preferred it is not essential so long as the separation spaces 84 and 85 are above and the separation spaces 83, 86, and 87 are below such median line.

The utility of my arrangement can be best described, it is believed, by comparing the manipulation of the form of Fig. 1 with that of Fig. 2 in formulating the combinations as employed by skilled operators.

Due to the fact there are only ten fingers on the hands and twenty-six letters in the alphabet, it is apparent that, to produce the alphabet, at times it will be necessary to "make" certain letters by using combinations of other letters. In the following description the combinations of letters are identified by numerals as shown in Fig. 3. They are formed as follows:

Initial consonants

The letter initial S (2) is used in most systems as the sound "s," soft "c," and "ex" when such prefix precedes a consonant. The next letter is initial T (3), and the next letter is K (4). When T and K are struck together, the fourth finger striking on the separation space 70, the letters as they appear on the tape TK (5) are read as the letter D. The next letter is initial P (6). When T and P are struck together they appear as TP (7) and are read from the tape as F. When the letters K and initial P are struck together they appear as KP (8) and are read from the tape as "ex" when preceding vowel sounds and letter "x" in the alphabet. The next letter is W (9). When TKPW (10) are struck in combination with each other by striking the separation spaces 70 and 71 they are read from the tape as the letter G. The letters initial P and W when struck together by striking the separation space 71 appear as PW (11) and are read from the tape as the letter B. The next letter is H (12). When initial P and H are struck together they appear as PH (13) and are read from the tape as the letter M. When the letters TPH (14) are struck in combination with each other they are read from the tape as the letter N. The next letter is initial R (15). When the letters H and R are struck together by striking the separation space 72 they appear as HR (16) and are read from the tape as the letter L. When the letters KW (17) are struck together they are read from the tape as Q in the alphabet and "qu" in phonetic spelling. The letters KWR (18) when struck together are read from the tape as the letter Y. The letters SKWR (20) when struck together are read from the tape as the letter J. The letters STPH (21) when struck together are read as the question mark (?). The letters STKPWHR (22) when struck together simultaneously, the letter S, and the separation spaces 70, 71, and 72 are read as "question" in writing testimony. This group of letters is referred to as the "question bank" and is used only to designate that a question is asked of a witness. This is inserted immediately prior to the question.

Vowels

The next group of letters is known as the vowels, consisting of the letters on the keyboard AOEU (23) which are operated by the thumb on each hand. The letters EU (24) when struck together by striking 81 are read from the tape

as letter I. The letters AO when struck together are read from the tape as the sound "OO." The asterisk 26 strikes on the tape between the letters O and E, and this key is operated by the index finger of either hand.

The keyboard, up to and including the point herein described, is entirely satisfactory, and I have found that the position of these keys and the separation spaces between them should not be changed, as any change in their conventional position would result only in destroying more combinations than such change could possibly improve.

Most Stenotypists when employing the conventional keyboard of Fig. 1 have found much difficulty in writing certain combinations formed with the right hand; that is, in writing the combinations of the final consonants. These difficulties are obviated by employing the arrangement of Fig. 2.

Final consonants

I shall describe below, first, the combinations as they appear on the conventional keyboard as shown in Fig. 1, employing the conventional arrangement, and, second, as they appear in Fig. 2, employing the arrangement of my invention.

The first letter of the final consonant group is F, and this follows immediately after the asterisk. The next letter is final R. The letters F and R when struck together by striking the separation space 75 appear as FR (27) and are read from the tape as FER. The next letter is final P (28). The letters F and final P when struck together appear as FP (29) and are read from the tape as CH (in some systems also as J). The next letter is B (30). The letters P and B when struck together by striking the separation space 76 appear as PB (31) and are read from the tape as letter N. The letters final R and B when struck together appear as RB (32) and are read as SH. The letters FPB (33) when struck together by striking the separation space 76 are read as FN (e. g., as in the word "given," phonetically "gifn"). On my keyboard the "F" key has been lengthened or extended toward the operator, thus moving the space 75 between the F and R toward the operator below the median level 88. The "P" key has been shortened, the "B" key lengthened, thus moving the separation space 76 away from the operator to above the median line 88. This permits the index finger to depress the letter F and at the same time the third finger may depress the letters PB (or N) in a position opposite, and are read from the tape as the sound RF (36) (e. g. serve). On the conventional keyboard striking the FR by placing the index finger on the separation space to also print at the same time with the third finger the letter B, it is necessary to "curl" the third or middle finger under. On my keyboard, due to the fact that the space 83 has been moved toward the operator and the B key lengthened away from the operator, it is possible to depress the keys FRB by placing the index finger on the space 83 with the middle finger directly opposite on the B key.

The next letter is L (37). The letters PL (38) when struck together are read from the tape as M. The next letter is G (39). This letter is also used as the suffix "ing." Letters B and G when struck together appear as BG (40) and are read from the tape as the letter K. PBLG (41) formed by striking spaces 84 and 85 simultaneously is used in two different ways, depending upon the system used by the writer. The more common system uses this group of letters to indicate the letter J. Another well known system uses this group of letters to indicate the sound "th," where it is a final consonantal diagraph, as in "forth" written as TPORPBLG (42). The next letter is final T (43). The letters PLT (44) when struck together are read from the tape as the suffix "ment," as in "cement" written SEPLT (45). The letters FPLT (46) when struck together are read from the tape as the period (.) The letter final T is also used to indicate the suffixes "ate," "ity," and, in some instances, "it" and "et" (e. g., vacate, purity, summit, ticket), shown in column on Fig. 3 under 47.

The next letter is the second S (48). The letters G and S appear as GS (49) and when struck together in combination with other letters on the keyboard are read from the tape as "shal," "tial," "tious," "sion," "tion," "ition," "ation" (e. g., marshal, martial, cautious, mission, execution, apparition, manipulation) shown in column as 50. The letters B, G, and second S when struck together appear as BGS (51) and are read from the tape as the letter X or KS. The letters RBGS (52), where S is the second S, when struck together are read from the tape as the comma (,). The next letter is D (53). This letter is used not only for words ending in D, but also to indicate the past tense of verbs. The next letter is final S (54) and indicates the plural of words ending in D. These latter two keys are operated by the same finger (namely, the little finger) as are the T and the second S keys. This is the only finger on either hand which operates more than two keys.

The combination FBG (55) is used to indicate the ending "FK," as in the word "traffic" shown at 56. On my keyboard the fingering of this combination has been much simplified by reason of the space 83 being moved toward the operator and the spaces 84 and 85 being moved away from the operator, enabling the combination FBG to be struck by merely placing the fingers in a straight line. On the conventional keyboard the striking of these letters necessitates straightening the index finger and reaching for the F while at the same time turning the middle and fourth fingers under to strike the BG keys. A great many words end with the sound "kt" and there are a great many phrases which have the BG (40) followed by T (43). The letter K struck as BG (40) is an abbreviation for "can" in all systems and the letter T (43) is an abbreviation for "it" and "the," and this keyboard facilitates the fingering of BGT because the space 86 has been moved toward the operator and the spaces 84 and 85 have been moved away from the operator. This means, as will be seen from Fig. 2, that EGT can be struck by placing the fingers in a straight line. Heretofore, employing the form of Fig. 1 to strike the combination BGT, employing the final T, it was necessary to turn the hand to the right because the little finger is short. The PBT, employing the final P and T, combination, which is read "nt," has always been a difficult combination to write. This combination has also necessitated the turn of the hand. On my keyboard the space 84 has been moved away from the operator while the space 86 has been moved toward the operator, thus enabling the middle finger to be placed on the space 84 farther away from the operator than was heretofore possible while simultaneously placing the little finger on the now lengthened final T key.

The letters FRPB (57), employing the final R and P, are used in some systems for the sound "rch," as in "church," see 58. The letters FRPBLG (59), employing the final R and P, are used in some systems to indicate the sound "nch," as in "branch," see 60. Both of these combinations are simplified by my arrangement of the keys. The letters LGTS (61), employing the final T and second S, are used in some systems for the sound "tl," as in "bottle," "metal," shown in column at 62. This combination is also used in some systems to indicate the word "did," see 61, and sometimes "little." This combination on the conventional keyboard of Fig. 1 has always been a very difficult combination to finger, due to the fact that the fourth finger and little finger must be placed squarely upon these keys in order to produce a clear outline in the notes. I have found that very often, due to the shortness of the little finger, the letter final T in this group has been erroneously omitted in high-speed writing. On my keyboard the space 86 has been moved toward the operator, while the space 85 has been moved away, thus placing these four keys squarely beneath the natural position of these two fingers. The letters LGDS (63), employing the final S, are used to indicate the ending "dl" (e. g., medal, middle, shown in column at 64) and are written on the machine by placing the fourth finger on the space 85, skipping the space 86 and striking the space 83 with the little finger. On my keyboard this combination has been simplified, as has the next preceding described combination.

The letters FRPBLGTS (65), employing the final P and T and second S, when struck together by striking the spaces 83, 84, 85, and 86 are read from the tape as "answer." This group of letters is referred to as the "answer bank" and is used only to designate that an answer follows. Due to the fact that the initial S, which appears at the extreme left of the Stenotype keyboard, is really one key, the little finger may operate this key by barely touching the end of it. The same relative position in connection with the right hand brings a different problem because, while the initial S is operated with the little finger of the left hand, it will be seen that the little finger of the right hand operates four keys, the final T, the second S, the D, and final S keys. On the conventional keyboard, to strike the answer bank necessitates the placing of the index finger and the little finger in a straightened position while at the same time curling the middle finger and fourth finger in order to place them in a straight row upon the straight space. In high-speed writing, such fingering combinations are difficult. On my keyboard the whole answer bank may be struck by merely dropping the fingers in a natural position on the right-hand side of the keyboard.

In contradistinction to the improvement made by the arrangement of Fig. 2 for the right-hand side of the keyboard, the left side, or initial consonant side, of the Stenotype keyboard should not be changed in any respect because such combinations as "dpl" (TKPHR, 66), as in the word "deplete" shown at 67, would be made more difficult were the same principle applied to the left side of the keyboard as I have applied to the right side, or final consonant side of the keyboard. Another combination which would be harmed is TKPH ("dm") shown at 68, as used in "demand" shown at 69.

I believe that a keyboard which incorporates into the left hand the same principle as I have incorporated into the right hand would put the operator in a position not materially an improvement over the present keyboard of Fig. 1, for while it will improve the right-hand side of the keyboard, it will worsen the left-hand side. Arranging the keys of the left hand to appear similar to those of the right hand will actually destroy more combinations than it would improve. Of course, if this disadvantage is accepted or if some other arrangement of keys introduces any desired improvement, the arrangement of the right-hand side of the keyboard as described above will give the advantageous operation of the final consonant keys and combinations described above.

While I have described a particular embodiment of my invention for the purpose of illustration, it should be understood that various modifications and adaptations thereof may be made within the spirit of the invention as set forth in the appended claims.

I claim:

1. A keyboard for stenographic writing machines, comprising a group of keys for actuating the initial consonant letters S, T, K, P, W, H, and R and the symbol asterisk and a space mechanism, all of said keys arranged on the left of the longitudinal axis of the keyboard, said keys being arranged in rows with the first row composed of the S key and the second, third, fourth, and fifth rows composed of pairs of keys one spaced above the other and separated therefrom by a separation space, the pair comprising the second row being composed of the key for the letter T spaced above the key for the letter K, the third row being composed of the key for the letter P spaced above the key for W, the fourth row being composed of the key for the letter H spaced above the key for R, and the fifth row being composed of the key for the asterisk spaced above the space key, the separation spaces for each of the second to the fifth rows, inclusive, being spaced in a line, said keyboard also containing a group of keys spaced on the right-hand side of the longitudinal axis of the keyboard for actuating the final consonants F, R, P, B, L, G, T, second S, D, and final S, said keys being arranged in five rows, each row composed of two keys one above the other, and the keys in each row separated from each other by a separation space, the first row being composed of the key for F spaced above the key for R, the second row composed of the key for the letter P spaced over the key for B, the third row composed of the key for L spaced above the key for G, the fourth row composed of the key for the letter T spaced above the key for the second S, and the fifth row composed of the key for D spaced above the key for the final S, the separation spaces for the first, fourth, and fifth rows of said keys for the final consonants being spaced below said first-mentioned line of separation spaces for the keys on the left of the longitudinal axis, and the separation spaces for the second and third rows of keys in the rows on the right-hand side of the longitudinal axis being spaced above the said first-mentioned line of separation spaces of the keys on the left-hand side of the longitudinal axis of the keyboard.

2. A keyboard for stenographic writing machines, comprising a group of keys for actuating the initial consonant letters S, T, K, P, W, H, and R and the symbol asterisk and a space mechanism, all of said keys arranged on the left of the longitudinal axis of the keyboard, said keys

being arranged in rows with the first row composed of the S key and the second, third, fourth, and fifth rows composed of pairs of keys one spaced above the other and separated therefrom by a separation space, the pair comprising the second row being composed of the key for the letter T spaced above the key for the letter K, the third row being composed of the key for the letter P spaced above the key for W, the fourth row being composed of the key for the letter H spaced above the key for R, and the fifth row being composed of the key for the asterisk spaced above the space key, the separation spaces for each of the second to the fifth rows, inclusive, being spaced in a straight line on the transverse axis of the keyboard, said keyboard also containing a group of keys spaced on the right-hand side of the longitudinal axis of the keyboard for actuating the final consonants F, R, P, B, L, G, T, second S, D, and final S, said keys being arranged in five rows, each row composed of two keys one above the other, and the keys in each row separated from each other by a separation space, the first row being composed of the key for F spaced above the key for R, the second row composed of the key for the letter P spaced over the key for B, the third row composed of the key for L spaced above the key for G, the fourth row composed of the key for the letter T spaced above the key for the second S, and the fifth row composed of the key for D spaced above the key for the final S, the separation spaces for the first, fourth, and fifth rows of said keys for the final consonants being spaced below said first-mentioned line of separation spaces for the keys on the left of the longitudinal axis, and the separation spaces for the second and third rows of keys in the rows on the right-hand side of the longitudinal axis being spaced above the said first-mentioned line of separation spaces of the keys on the left-hand side of the longitudinal axis of the keyboard.

3. A keyboard for stenographic writing machines, comprising a group of keys for actuating the initial consonant letters S, T, K, P, W, H, and R and the symbol asterisk and a space mechanism, all of said keys arranged on the left of the longitudinal axis of the keyboard, said keys being arranged in rows with the first row composed of the S key and the second, third, fourth, and fifth rows composed of pairs of keys one spaced above the other and separated therefrom by a separation space, the pair comprising the second row being composed of the key for the letter T spaced above the key for the letter K, the third row being composed of the key for the letter P spaced above the key for W, the fourth row being composed of the key for the letter H spaced above the key for R, and the fifth row being composed of the key for the asterisk spaced above the space key, the separation spaces for each of the second to the fifth rows, inclusive, being spaced in a line, said keyboard also containing a group of keys spaced on the right-hand side of the longitudinal axis of the keyboard in two transverse lines for actuating the final consonants F, R, P, B, L, G, T, second S, D, and final S, said keys being arranged in five rows, each row composed of two keys one above the other, and the keys in each row separated from each other by a separation space, the first row being composed of the key for F spaced above the key for R, the second row composed of the key for the letter P spaced over the key for B, the third row composed of the key for L spaced above the key for G, the fourth row composed of the key for the letter T spaced above the key for the second S, and the fifth row composed of the key for D spaced above the key for the final S, the separation spaces for the first, fourth, and fifth rows of said keys for the final consonants being spaced below said first-mentioned line of separation spaces for the keys on the left of the longitudinal axis, and the separation spaces for the second and third rows of keys in the rows on the right-hand side of the longitudinal axis being spaced in a straight line above the said first-mentioned line of separation spaces of the keys on the left-hand side of the longitudinal axis of the keyboard.

4. A keyboard for stenographic writing machines, comprising a group of keys for actuating the initial consonant letters S, T, K, P, W, H, and R and the symbol asterisk and a space mechanism, all of said keys arranged on the left of the longitudinal axis of the keyboard, said keys being arranged in rows with the first row composed of the S key and the second, third, fourth, and fifth rows composed of pairs of keys one spaced above the other and separated therefrom by a separation space, the pair comprising the second row being composed of the key for the letter T spaced above the key for the letter K, the third row being composed of the key for the letter P spaced above the key for W, the fourth row being composed of the key for the letter H spaced above the key for R, and the fifth row being composed of the key for the asterisk spaced above the space key, the separation spaces for each of the second to the fifth rows, inclusive, being spaced in a straight line on the transverse axis of the keyboard, said keyboard also containing a group of keys spaced on the right-hand side of the longitudinal axis of the keyboard in two transverse lines for actuating the final consonants F, R, P, B, L, G, T, second S, D, and final S, said keys being arranged in five rows, each row composed of two keys one above the other, and the keys in each row separated from each other by a separation space, the first row being composed of the key for F spaced above the key for R, the second row composed of the key for the letter P spaced over the key for B, the third row composed of the key for L spaced above the key for G, the fourth row composed of the key for the letter T spaced above the key for the second S, and the fifth row composed of the key for D spaced above the key for the final S, the separation spaces for the first, fourth, and fifth rows of said keys for the final consonants being spaced below said first-mentioned line of separation spaces for the keys on the left of the longitudinal axis, and the separation spaces for the second and third rows of keys in the rows on the right-hand side of the longitudinal axis being spaced in a straight line above the said first-mentioned line of separation spaces of the keys on the left-hand side of the longitudinal axis of the keyboard.

LAWRENCE HOLMES, JR.

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