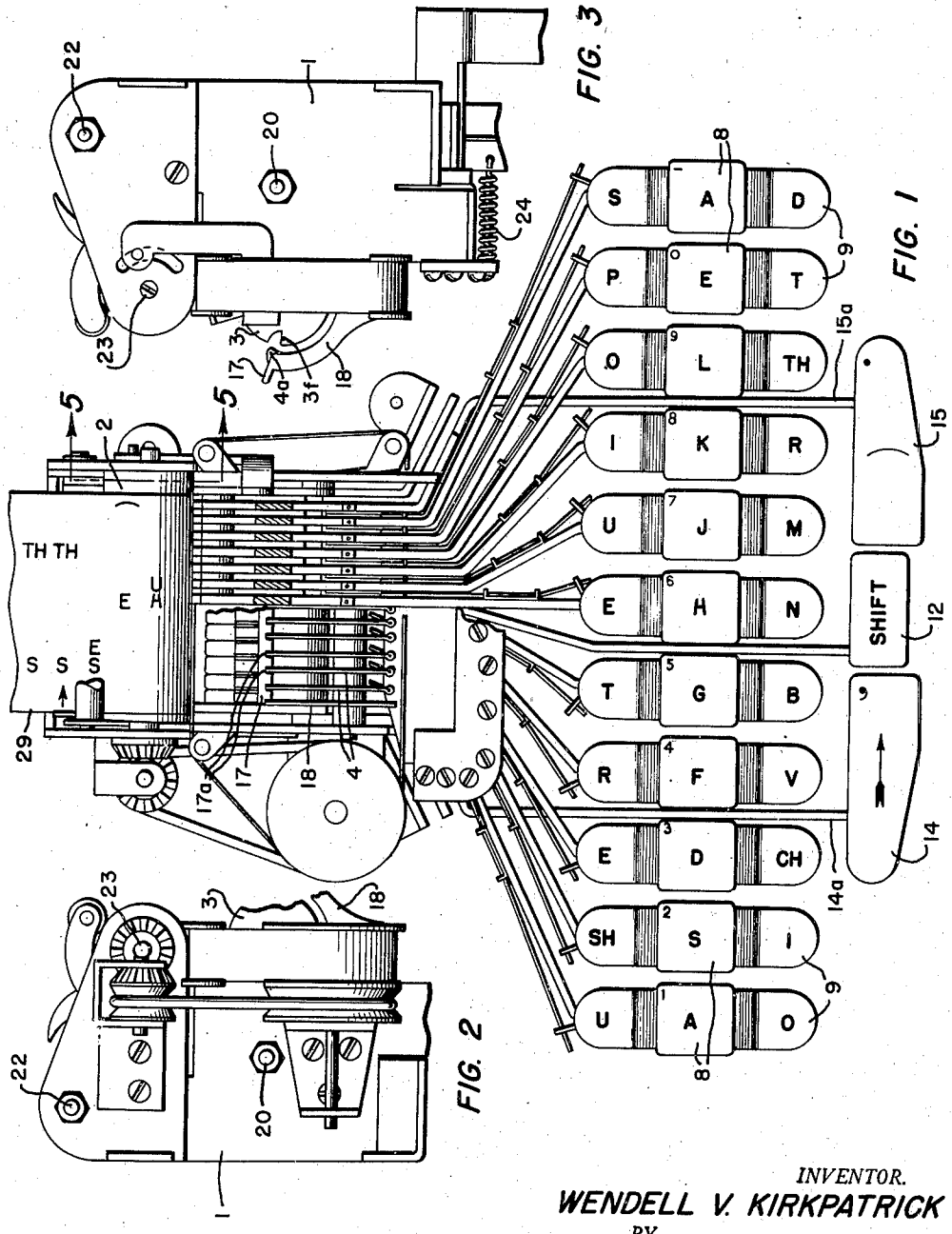
Sept. 14, 1948. W. V. KIRKPATRICK 2,449,126

MECHANICAL SHORTHAND WRITING MEANS

Filed Nov. 2, 1945

2 Sheets-Sheet 1



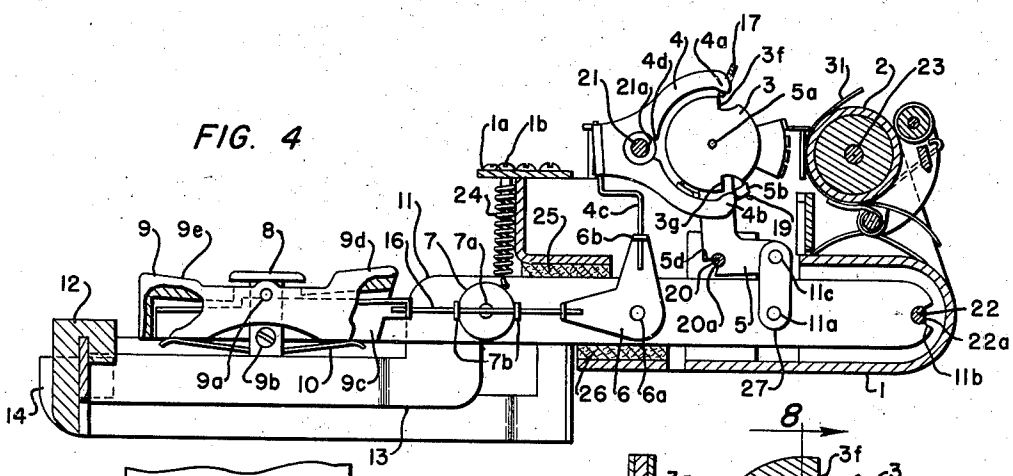

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MECHANICAL SHORTHAND WRITING MEANS

Filed Nov. 2, 1945 2 Sheets-Sheet 2

FIG. 4



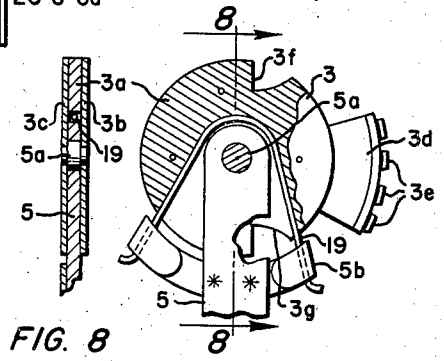




FIG. 8

FIG. 7

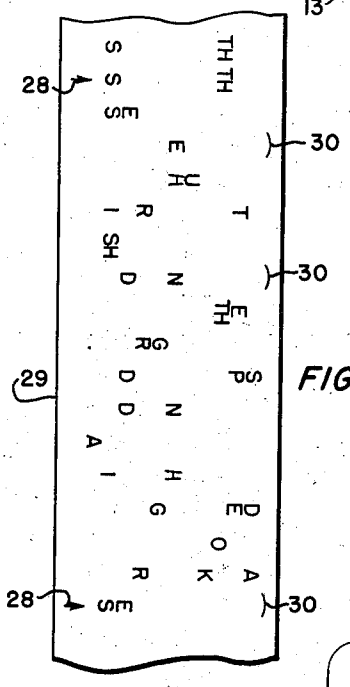



FIG. 5

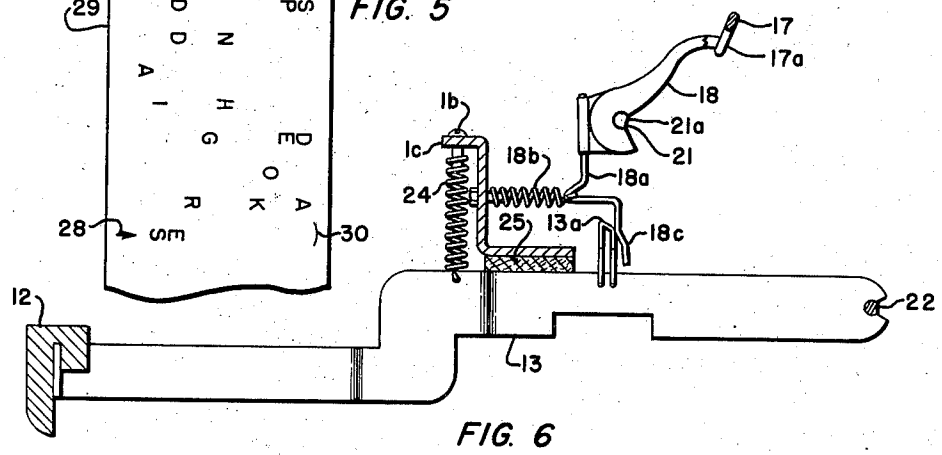



FIG. 6

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# UNITED STATES PATENT OFFICE

2,449,126

## MECHANICAL SHORTHAND WRITING MEANS

Wendell V. Kirkpatrick, Bonita, Calif.

Application November 2, 1945, Serial No. 626,222

9 Claims. (Cl. 197—9)

1

My invention relates to a mechanical shorthand writing means more particularly an improvement over my former Patent Number 2,325,-612, and the objects of my invention are:

First: To provide a simple method of indicating a reversal of sequence of the letters in printed combination thus increasing substantially the possible combinations without additional strokes.

Second: To provide a means of this class in which a reading direction key may be operated by a thumb of the operator for printing on the paper strip a pointer indicating a reversal in direction of reading of combinations printed transversely of the paper strip, whereby the printed combinations are normally read in one direction transversely of the paper strip unless the pointer indicates that the subject matter should be read in the opposite direction.

Third: To provide a means of this class in which the arrangement of the keys relative to certain characters together with the reading direction key promotes versatility of the use of said keyboard in printing a variety of combinations.

Fourth: To provide a simple means of this class in which a continuity key is arranged for use in indicating the continuance of a word or phrase from one transverse line to another on the paper strip.

Fifth: To provide a keyboard arrangement of this class in which the operations accomplished by the thumbs of both hands are within range of the thumbs, taking full advantage of the same without overtaxing the agility and reach thereof whereby the use of my mechanical shorthand writing machine is greatly facilitated in learning and in practice.

Sixth: To provide an automatic shifting mechanism of such design that at least three characters each represented by a key on the keyboard may be grouped together to print in a single type position making possible the compact construction of the type shifting wheels whereby a narrower paper strip may be used which in turn makes combinations of letters in the type positions at opposite edges of the paper strip more easily read by reducing the distance between them.

Seventh: To provide an automatic shifting mechanism of such design that the overall weight and size of my mechanical shorthand writing means is materially reduced.

Eighth: To provide a means of this class in which an independent figure shifting mechanism operated by either thumb causes a shift of the

2

type shifting wheels to a position for printing figures or signs printed by neither normal nor automatically shifted type positions of said type shifting wheels.

Ninth: To provide a mechanical shorthand writing means having a keyboard incorporating a key which will print an open top A, readable in combinations as either an H or an A.

Tenth: To provide a mechanical shorthand writing means of this class which is very simple and economical to manufacture in proportion to its utility, efficient in its action and which will not readily deteriorate or get out of order.

With these and other objects in view as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon forming a part of this application, in which:

Fig. 1 is a top or plan view of my mechanical shorthand writing means showing portions broken away and in section to amplify the illustration. Fig. 2 is a fragmentary side elevational view thereof. Fig. 3 is a fragmentary side elevational view thereof taken from the opposite side. Fig. 4 is a longitudinal sectional view thereof showing portions broken away and in section to amplify the illustration. Fig. 5 is a fragmentary side elevational view of the printed paper strip printed by my mechanical shorthand writing means. Fig. 6 is a side elevational view of the shift key lever in cooperative relation with the shift bar and shift bar lever. Fig. 7 is an enlarged fragmentary side elevational view of one of the type shifting wheels together with cooperative parts showing portions thereof broken away and in section to amplify the illustration; and Fig. 8 is a fragmentary sectional view taken from the line 8—8 of Fig. 7.

Similar characters of reference refer to similar parts and portions throughout the several views of the drawing.

The frame 1, platen roller 2, type shifting wheels 3, shift tongs 4, bellcranks 5 and 6, fulcrum member 7, fixed keys 8, pivoted keys 9, leveling spring 10, main key levers 11, figure shift key 12, figure shift key lever 13, reading direction key 14, continuity key 15, lever 16, figure shift bar 17, figure shift bar supports 18, shift wheel leveling springs 19, shafts 20 to 23 inclusive, main key lever springs 24, pads 25 and 26, and links 27 constitute the principal parts

and portions of my mechanical shorthand writing means.

The platen roller 2 is rotatively mounted in connection with the frame 1 by means of the shaft 23 as shown best in Figs. 3 and 4 of the drawing. The shaft 20 as shown in Fig. 4 of the drawing is connected to opposite sides of the casing 1 as shown in Figs. 2 and 3 of the drawing and supports the bellcranks 5, which carry the type shifting wheels 3 at their upper ends as shown best in Fig. 7 of the drawing. The type shifting wheels 3 are pivotally mounted on the upper ends on the bellcranks 5 by means of pins 5a and the type shifting wheels 3 are maintained in level disposition by means of the U-shaped spring 19 fitted in the body portion 3a of said type shifting wheels 3 and engaging a bracket 5b secured on the bellcranks 5 and holding opposite ends of said shift wheel leveling springs 19, all as shown best in Fig. 7 of the drawing. The type shifting wheels 3 are maintained in certain disposition to the axis of the vertical leg of the bellcranks 5 by the springs 19 until affected by the tong portions 4a and 4b of the shift tongs 4 which are pivotally connected in stationary relation with the frame 1 on the shaft 21 as shown in Fig. 4 of the drawing. As shown in Fig. 8 of the drawing the type shifting wheels 3 are provided with a main body portion 3a and plate portions 3b and 3c on opposite sides thereof through which the pins 5a extend connecting the upper end of the bellcranks 5 to the type shifting wheels 3 pivotally supporting the same in connection with said bellcranks 5. It will be noted that each type shifting wheel 3 is provided with an extended arcuate portion 3d on which the type 3e is secured. The tong portions 4a and 4b of the shift tongs 4 are arranged to engage notch portions 3f and 3g for rotatively shifting the type shifting wheels in connection with the bellcranks 5. Secured on the opposite side of the shaft 21 from the type shifting wheels 3 to the shift tongs 4 are resilient arm portions 4c extending into engagement with the bellcranks 6 which are pivoted on the pins 6a in connection with the main key levers 11. It will be here noted that the connection of the arm portions 4c of the shift tongs 4 is a slip fit thereof in an opening in a laterally extending portion 6b of the bellcranks 6 providing a free connection therewith. A fulcrum member 7 is pivotally mounted on each of the main key levers 11 by means of the pin 7a and is provided with a pair of laterally extending portions 7b through which the lever 16 extends, all as shown best in Fig. 4 of the drawing. One end of this lever 16 is inserted in an opening in the bellcrank member 6 and arranged in slip fit relation therewith while the opposite end of the lever 16 is arranged in similar connected relation with the plate 9c rigidly secured to one of the pivoted keys 9 which is pivotally mounted on a pin 9a extending through the fixed key 8 which is rigidly secured on the extending end of the main key lever 11 as shown in Fig. 4 of the drawing by the bolt 9b which also mantains the plate spring 10 in engagement with the pivoted key 9 for holding the same in level position as shown best in Fig. 4 of the drawing. It will be here noted that each of the main key levers 11 is pivotally mounted in connection with the shaft 22 extending through the sides of the frame 1 as shown best in Figs. 2 and 3 of the drawing. The link 27 is connected to the main key lever 11 by means of the pin 11a and this link 27 is pivotally connected with bellcrank 5 at its opposite end by means of the pin 11c. The key lever springs 24 are adjustably secured at their upper ends to the frame 1 by screws 1b. These springs 24 tend to hold the main key levers upwardly in engagement with the pad 25 which may be a resilient pad for cushioning the upward movement of the main key levers 11. The figure shift bar 17 is connected to the figure shift bar supports 18 which are pivotally mounted on the shaft 21, as shown best in Fig. 6 of the drawing. Rigidly connected with the figure shift bar supports 18 is an arm 18a connected to a spring 18b secured to the portion 1c of the frame 1, the spring 18b thus tending to shift the figure shift bar supports 18 together with the figure shift bar 17 downwardly into engagement with the notched portions 3f of the type shifting wheels 3. The arm portion 18a in connection with the figure shift bar supports 18 is provided with an angular portion 18c engageable with the upwardly extending arm portion 13a of the figure shift key levers 13 which is held in the position as shown in Fig. 6 of the drawing against the pad 25 by the spring 24 maintaining the figure shift bar 17 out of engagement with the notch portions 3f of the type shifting wheels 3. It will be here noted that the type shifting wheels 3 serve principally as type supporting members and carry four vertically aligned type members thereon designated 3e in Fig. 7 of the drawing which are arcuately disposed relatively to each other about the axis of the pin 5a securing the bellcranks 5 to the type shifting wheel 3 as shown in Fig. 7 of the drawing. As shown in Fig. 6 of the drawing the figure shift bar 17 is provided with a plurality of notched portions 17a which fit over the long portions 4a of the shift tongs 4. The shift tongs 4 as shown in Fig. 1 of the drawing extend into the notched portions 17a which permit the arcuate travel of the figure shift bar 17 over the tongs 4 into engagement with the notched portions 3f of the type shifting wheels 3. It will be here noted that thirteen of the type shifting wheels 3 are employed in my mechanical shorthand writing means and that the reading direction key 14 and continuity key 15 are each in connection with one of these type shifting wheels 3 and operate directly in connection with the levers 14a and 15a respectively which are pivotally connected to bellcranks 5 by the links 27. It will be noted that the reading direction key 14 is cooperatively connected with the type shifting wheel 3 at the extreme left side of the assembly as shown in Fig. 1 of the drawing and that the continuity key 15 is cooperatively connected with the type shifting wheel 3 at the extreme right hand side of the assembly as shown in Fig. 1 of the drawing, whereby the pointer printed by use of the reading direction key is on the paper strip at the opposite edge thereof from the designation printed by the operation of the continuity key 15 which is arranged to indicate continuation of a combination or word read from one line to the next transversely on the paper strip. In connection with the reading direction key and on the type shifting wheel 3 in connection therewith is an additional type member arranged to impress a comma which may be operated by depressing the figure shift key and striking the reading direction key 14. When the continuity key is struck in a similar manner during depression of the figure shift key a period is printed which normally

indicates the end of a sentence in use of my mechanical short hand writing means.

As shown in Fig. 5 of the drawing the reading direction key 14 prints the pointer 28 on the paper strip 29 near one edge thereof and the continuity key 15 prints the arcuate designation 30 at the opposite edge of the paper strip as used in my shorthand writing means. This arcuate continuity designation means is particularly adapted to the use of my mechanical shorthand writing means for carrying continuity of a word or designation from one line to the other when reading the lines in continuity transversely of the paper strip.

The translation of the subject matter as shown in Fig. 5 is: "This is the easy way to write shorthand with great speed and a high degree of accuracy."

As shown in Fig. 5 all the subject matter is read from one side of the paper strip 29 to the other unless the pointer indicates reading in the opposite direction. The continuity designation 30 as used in my mechanical shorthand writing means is in the form of an arcuate line disposed at the end of one line indicating continuity of the subject matter in connection with the preceding line readable transversely on the paper strip. Thus the example as shown in Fig. 5 indicates the reading direction of the subject matter from one edge of the strip to the other and only in the reverse direction when the pointer so indicates.

The operation of my mechanical shorthand writing means is substantially as follows:

When one of the fixed keys 8 is depressed in its rigid connected relation with one of the main key levers 11, the main key lever 11 is pivotally shifted downwardly in connection with the shaft 22 carrying the link 27 in connection with the bellcrank 5 which is pivotally shifted on the shaft 20 causing a type member 3e second from the top in connection with the type shifting wheels 3 to engage the platen roller 2 for printing through the inked ribbon 31 on paper in connection therewith. When these main key levers 11 shift downwardly the arms 4c in connection with the shift tongs 4 remain in stationary position due to the slidable connection therewith of the bellcrank 6 which simply shifts vertically on the arms 4c and does not cause any pivotal movement of the tongs 4 when the fixed key 8 is depressed. It will be noted that the fixed keys 8 are arranged to print numerals as well as literal characters and these numerals may be printed by the fixed keys 8 when the figure shift key 12 is depressed which brings the figure shift bar 17 into engagement with the notched portions 3f of the type shifting wheels 3 whereupon pivotal movement of the main key lever 11 causes the bellcranks 5 to shift the type shifting wheels toward the platen roller 2 which causes pivotal movement of the type shifting wheels 3 on the pin 5a due to restraint at the notched portion 3f bringing into alignment the type member 3e, third from the top, causing the same to print numerals on the paper over the platen roller 2. When the rear portion 9e of one of the pivoted keys 9 is depressed the plate 9c in connection with said pivoted key 9 causes the lever 16 to be pivoted about the axis of the fulcrum member 7 shifting the bellcrank 6 on the pin 6a in connection with the opposite end of the lever 16 pivotally shifting the shift tongs in connection therewith on the shaft 21. When the shift tong portions 4a engage the notched portion 3f of the type shifting



wheels 3 the forward movement of the type shifting wheels 3 is restrained at the upper portion thereof above the axis of the pin 5a bringing the lowermost type member 3e into alignment with the platen roller for printing on the paper thereover. It will be noted that the restraint of the notched portion 3f by the tong portion 4a of the shift tongs 4 cooperates with the shifting of said shifting wheels 3 by the bellcranks 5 whereby forward movement of the shift wheels 3 in connection with the bellcranks 5 cause the pivotal shifting of said shift wheel 3 on the pin 5a after engagement of said notched portions 3f by the tong portions 4a of the shift tongs 4. When the forward portion 9d of the same pivoted key 9 is depressed in connection with the plate 9c the lever 16 is pivoted in the opposite direction on the fulcrum member 7 reversing the operation of the bellcrank 6 together with the arm 4c of the shift tongs 4 engaging the tong portions 4b of the shift tongs 4 with the notched portion 3g of the type shifting wheels 3 causing rotation of the type shifting wheel in the opposite direction when the bellcrank member 5 forces the same toward the platen roller 2 whereupon the uppermost type member 3e in connection with said type shift wheel 3 engages the platen roller 2 over the paper in connection therewith for printing on the same. The use of the fixed key 8 together with the pivoted key 9 operating four different type members in connection with one main key lever greatly simplifies the construtcion of my mechanical shorthand writing means. The employment of four type members in connection with each type shifting wheel 3 is aided by use of the figure shift key 12 together with the cooperating figure shift bar 17 as shown best in Fig. 6 of the drawing. As shown in Fig. 7 of the drawing the type shifting wheels 3 are maintained in level relation with the bellcranks 5 by means of a spring 19 which is deflected in one direction or the other when the tong portions 4a or 4b engage the notched portions 3f or 3g as desired by the operator. This spring 19 is very light and causes very little resistance to the deflection of the same whereby the operational loads in the connected mechanism and keys are very low. It will be noted that the shafts 20, 21 and 22 are provided with flat chordal relief portions 20a and 21a and 22a respectively. The openings 5d, 4d and 11b of the bellcranks 5, shift tongs 4 and levers 11 are provided with chordal relief portions 5d, 4d and 11b respectively which permit removal of the four bellcranks 5, shift tongs 4 and levers 11 when the shafts 20, 21 and 22 are rotated slightly.

Though I have shown and described a particular construtcion, combination and arrangement of parts and portions, I do not wish to be limited to the particular construction, combination and arrangement but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. In a mechanical shorthand writing means the combination of a frame, a plurality of main key levers pivotally mounted in connection with said frame, a fixed key mounted on each of said main key levers, a pivoted key pivotally mounted on each of said main key levers near said fixed key and provided with key portions oppositely movable relative to said fixed key, a second lever

pivotally mounted intermediate its ends on each of said main key levers and cooperatively engaged at one end with said pivoted key, a bellcrank pivotally mounted on each of said main key levers and engaged with the opposite end of said second lever, a shift tong pivotally mounted in connection with said frame and provided with a pair of diverging tong portions and an arm portion slidably engaged with said bellcrank, a type supporting member pivotally mounted intermediate the diverging tong portions of said shift tong and having engaging portions at opposite sides of the pivotal axis thereof disposed near the ends of the tong portions in the arcuate path thereof, a second bellcrank pivotally connected with said frame and arranged in pivotal connection with said type supporting member at its upper end and cooperatively connected with said main key lever at its other end and a platen roller arranged in close spaced relation with said type supporting member.

2. In a mechanical shorthand writing means of the class described, a combination of a frame, a shift tong provided with two diverging tong portions pivotally mounted in connection with said frame, a type supporting member having type in connection therewith pivotally mounted intermediate the tong portions of said shift tong member and engageable thereby, a bellcrank pivotally connected with said frame and arranged in pivotally connected relation with said type supporting member at its one end, a main key lever pivotally connected with said frame and cooperatively connected with said bellcrank for shifting said type supporting member relatively to said tong portions, and a platen roller in spaced relation to said type supporting member in close proximity to the type in connection therewith.

3. In a mechanical shorthand writing means of the class described, a combination of a frame, a shift tong provided with two diverging tong portions pivotally mounted in connection with said frame, a type supporting member having type in connection therewith mounted intermediate the tong portions of said shift tong member and engageable thereby, a bellcrank pivotally connected with said frame and arranged in pivotally connected relation with said type supporting member at its one end, a main key lever pivotally connected with said frame and cooperatively connected with said bellcrank for shifting said type supporting member relatively to said tong portions, a platen roller in spaced relation to said type supporting member in close proximity to the type in connection therewith, and a spring in connection with said type supporting member and said bellcrank and arranged to maintain said type supporting member in certain disposition relatively to the axis of said bellcrank.

4. In a mechanical shorthand writing means of the class described, the combination of a platen roller, a frame for supporting the same, type supporting members movably mounted with said frame in cooperation with said platen roller and having type in connection therewith, and a reading direction key cooperatively connected with one of said type supporting members, the type in connection with said type supporting member having a pointer designation thereon arranged to print in a direction parallel to the axis of said platen roller for indicating reverse directional reading of lines transversely of a paper strip.



5. In a mechanical shorthand writing means of the class described, the combination of a platen roller, type supporting members movably positioned in close spaced relation to said platen roller, a reading direction key cooperatively connected with one of said type supporting members positioned near one end of said platen roller adapted to print a designation indicating reverse direction reading of subject matter transversely of a paper strip and a continuity key cooperatively connected to another of said type supporting members near the opposite end of said platen roller.

6. In a mechanical shorthand writing means of the class described, a combination of a platen roller, type supporting members movably positioned in close spaced relation to said platen roller, a reading direction key cooperatively connected with one of said type supporting members positioned near one end of said platen roller and a continuity key cooperatively connected to another of said type supporting members positioned near the opposite end of said platen roller, said reading direction key and said continuity key being at the front of the keyboard of the mechanical shorthand writing means and accessible to the thumbs of the operator thereof.

7. In a mechanical shorthand writing means of the class described, a combination of a platen roller, type supporting members having type in connection therewith movably positioned in close spaced relation to said platen roller, a reading direction key cooperatively connected with one of said type supporting members positioned near one end of said platen roller, a continuity key cooperatively connected to another of said type supporting members positioned near the opposite end of said platen roller, said reading direction key and said continuity key being at the front of the keyboard of the mechanical shorthand writing means and accessible to the thumbs of the operator thereof, and a figure shift key near said reading direction key and said continuity key in cooperative relation with said type supporting members for rotatively shifting the same and changing the disposition of said type in connection with said type supporting members whereby said reading direction key and said continuity key print other characters.

8. In a mechanical shorthand writing means of the class described, a combination of a frame, a platen roller in connection therewith, a plurality of type supporting members pivotally mounted relatively to said platen roller having a plurality of type members arranged in arcuate disposition relative to each other and spaced from said platen roller, each of said type supporting members having engaging portions disposed at opposite sides of the axis thereof, a plurality of shift tongs pivotally mounted in connection with said frame having tong portions engageable with said engaging portions of said type supporting members, a plurality of main key levers pivotally mounted in connection with said frame, pivoted keys in connection with said main key levers cooperatively connected with said shift tongs for selectively moving the tong portions thereof into engagement with said engaging portions of said type supporting members, and means interconnecting said type supporting members with said main key levers for shifting the same toward said platen roller.

9. In a mechanical shorthand writing means of the class described, the combination of a frame, a platen roller in connection therewith, a plural-

ity of type supporting members pivotally mounted relatively to said platen roller having a plurality of type members arranged in arcuate disposition relative to each other and spaced from said platen roller, each of said type supporting members having engaging portions disposed at opposite sides of the axis thereof, a plurality of shift tongs pivotally mounted in connection with said frame having tong portions engageable with said engaging portions of said type supporting members, a plurality of main key levers pivotally mounted in connection with said frame, pivoted keys in connection with said main key levers cooperatively connected with said shift tongs for selectively moving the tong portions thereof into engagement with said engaging portions of said type supporting members, means interconnecting said type supporting members with said main key levers for shifting the same toward said platen roller, a figure shift bar adjacent the engaging portions of one side of the type supporting members and engageable therewith and



a figure shift key cooperatively connected with said figure shift bar for moving the same into engagement with said engaging portions of said type supporting members, said type supporting members being arranged to rotate relatively to said shift tongs and said figure shift bar.

WENDELL V. KIRKPATRICK.


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