

Sept. 9, 1958

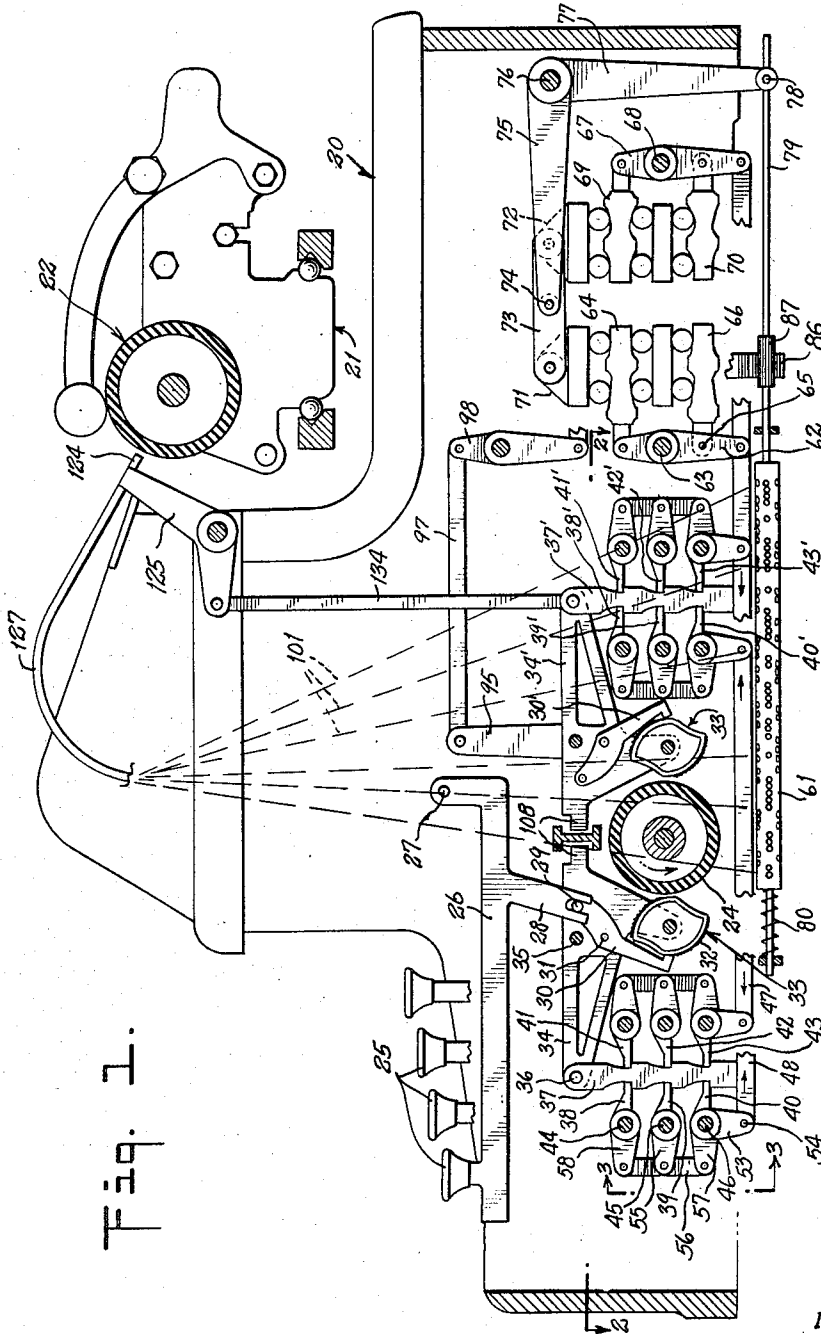
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2,851,141

WIRE PRINTING TYPEWRITER

Filed June 20, 1955

8 Sheets-Sheet 1



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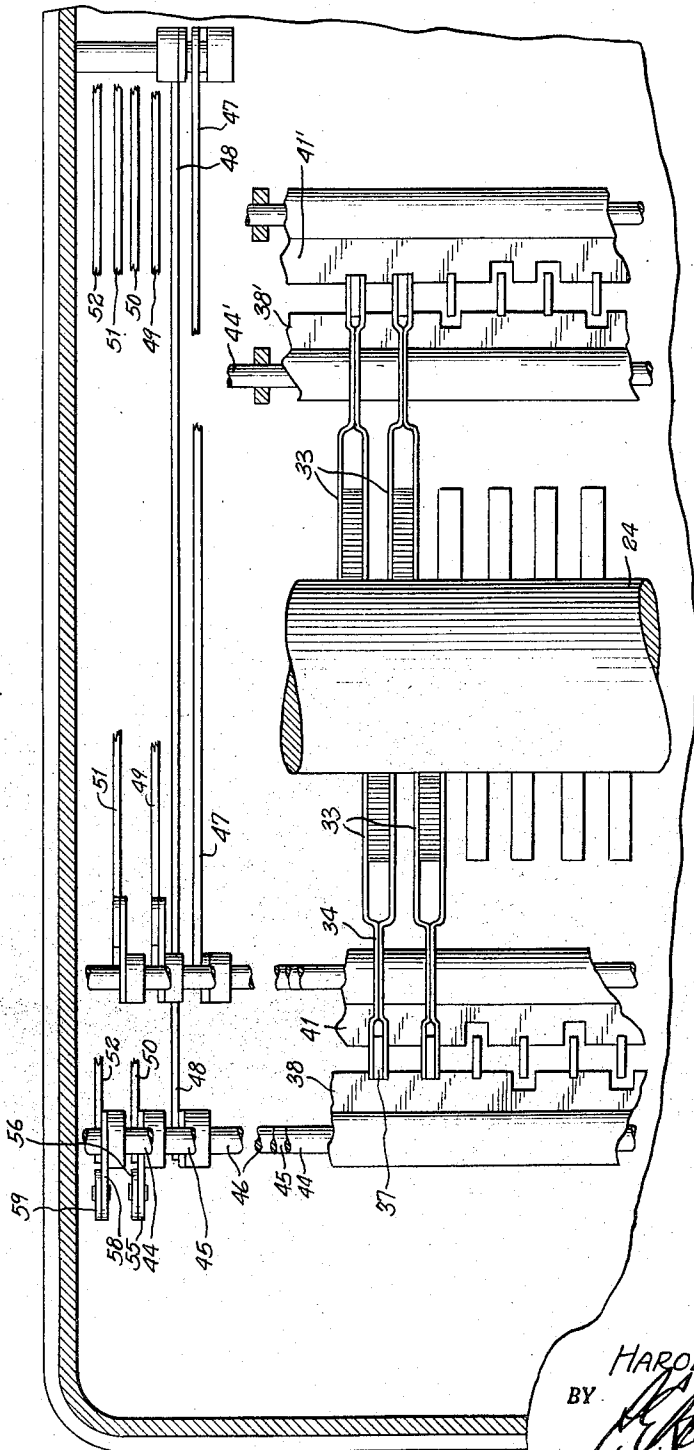
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WIRE PRINTING TYPEWRITER

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Fig. 2.



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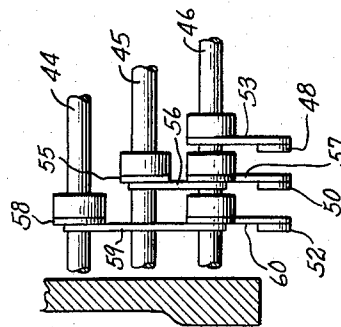
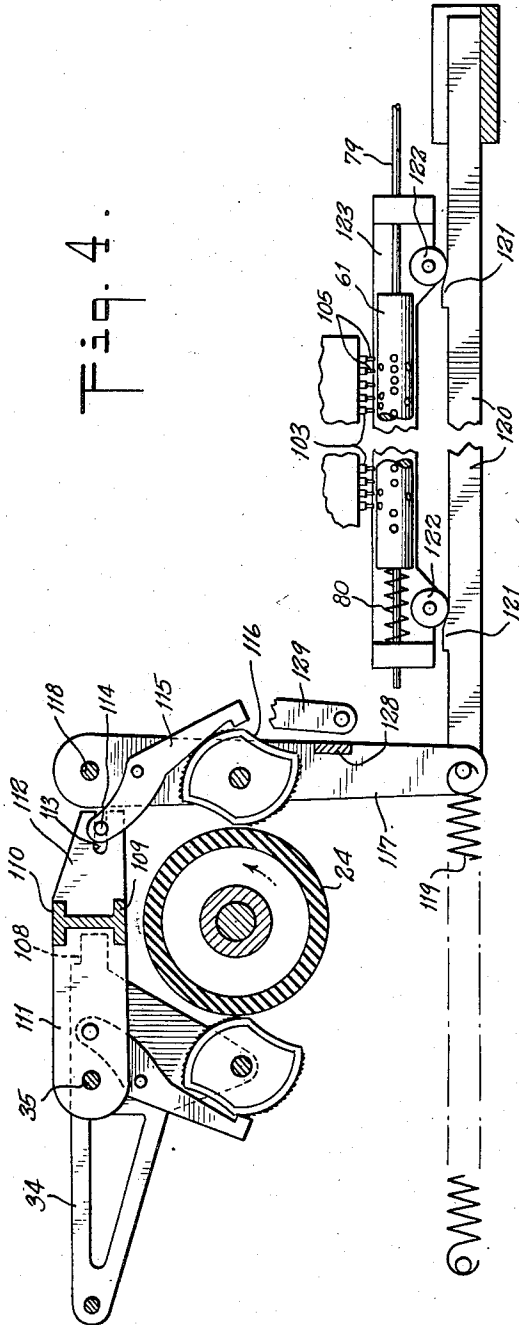
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WIRE PRINTING TYPEWRITER

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8 Sheets-Sheet 3



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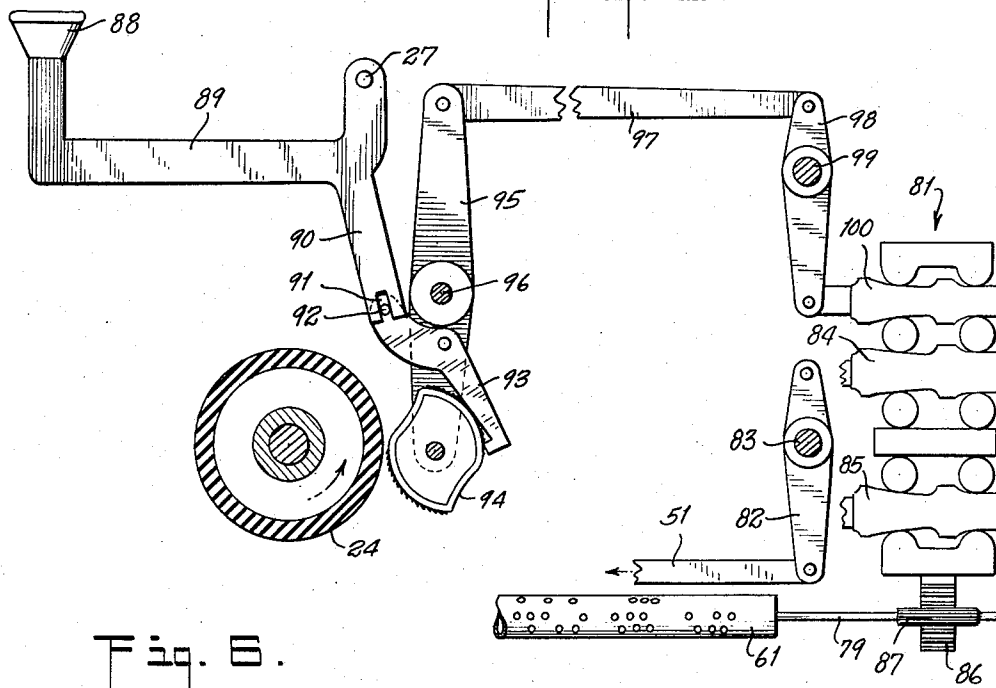
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WIRE PRINTING TYPEWRITER

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Fig. 5.



F 39. B.

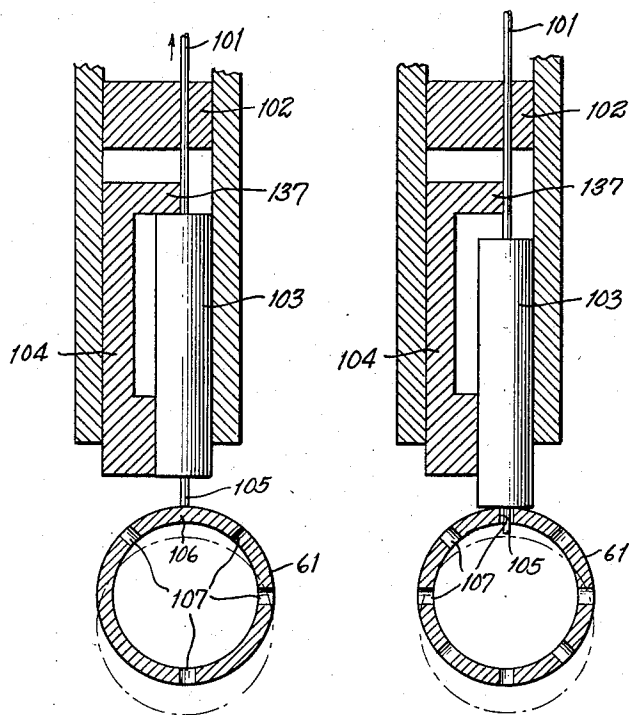


Fig. 7.

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WIRE PRINTING TYPEWRITER

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Fig. 8.

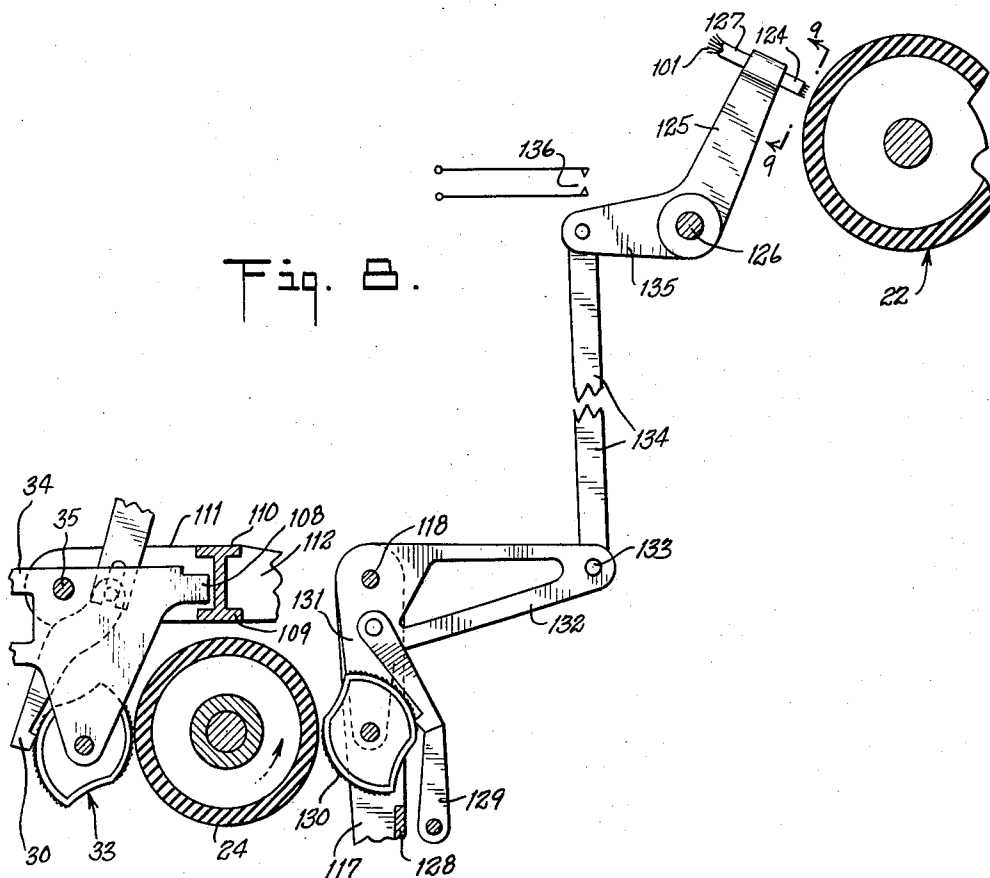
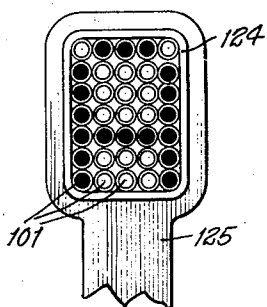


Fig. 9.



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WIRE PRINTING TYPEWRITER

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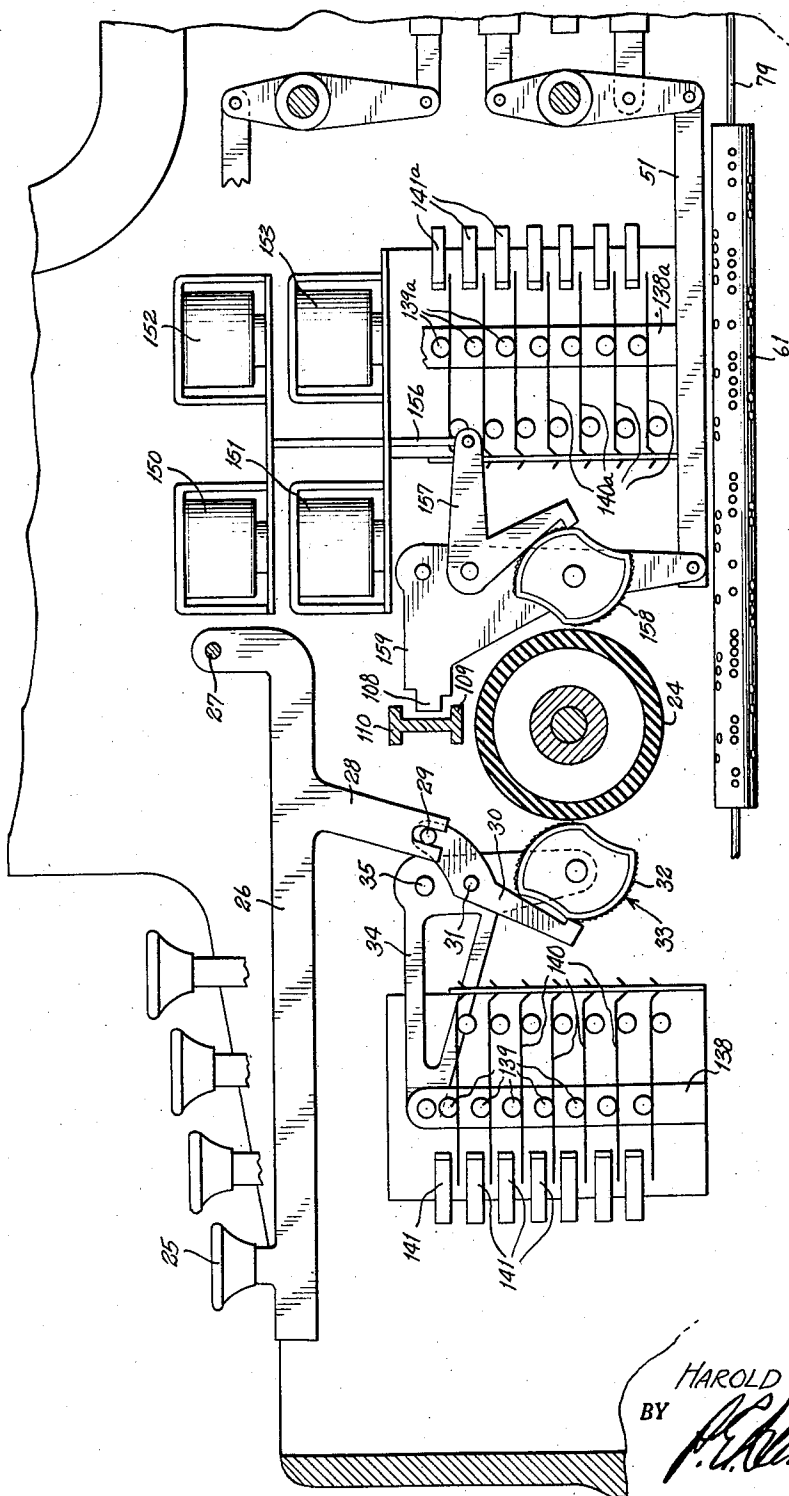


Fig. 10.

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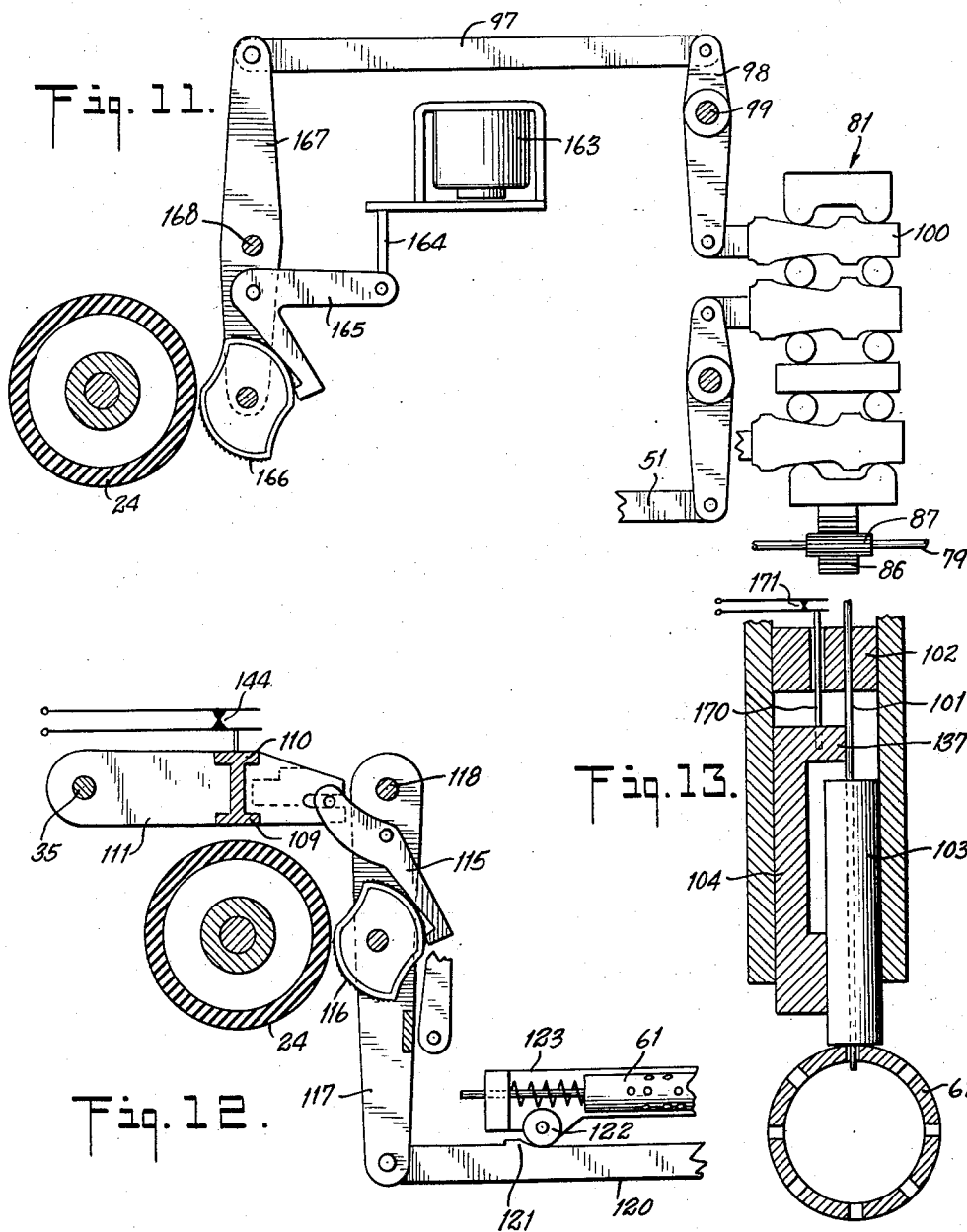
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WIRE PRINTING TYPEWRITER

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8 Sheets-Sheet 7



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2,851,141

WIRE PRINTING TYPEWRITER

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Application June 20, 1955, Serial No. 516,354

12 Claims. (Cl. 197—1)

The present invention relates to a wire printing typewriter and more particularly to a typewriter apparatus in which a group of wires are arranged with one end portion of each wire in a particular position in a cluster and carried by a printing head so as to print selected characters by a mosaic printing system. These wires are adapted for free solely-longitudinal movement relative to each other so that certain of the wires in the cluster may be projected slightly forwardly of the others and then when the head is brought into engagement with a surface on which the impression of the wire is to be placed or against a typewriter ribbon interposed between the wires and paper to be written upon, a character will be reproduced depending upon which of the wires are projected forwardly of the others. The other or remote end of each of the wires is positioned in a wire setting zone as is conventional in wire printing apparatus. The present arrangement further involves the provision of power means such as a continuously rotating power drive roll for providing power for actuating each of a number of necessary operating means incident to the operation of the typewriter. In general, the typewriter arrangements other than those particularly involved with the wires and their actuation by the several keys or otherwise may be substantially conventional in accordance with well known typewriter constructions now on the market. The description will, therefore, be confined to the novel features of the invention over and above those now in use or which are usable in accordance with known construction for power drive typewriters.

Summarizing the present invention, it involves the use of a code rod means including one or more code rods, each of which may be in the form of a cylinder movable axially and by rotation about the axis thereof for positioning different portions of the cylindrical surface opposite the ends of the wires which are to be set in a wire setting zone. Preferably certain depressions or holes are formed in the code rod where a wire is not to be moved longitudinally and the depressions or holes are omitted where it is desired to move a wire longitudinally. Then upon relative movement between the code rod means on the one hand, and the wire ends on the other, the wires to be moved longitudinally are moved simultaneously so as to set up the wires to print a given character. Each of the characters to be printed may correspond, in accordance with a predetermined code, with a particular position of the code rod means both axially and rotationwise, or, from a broader point of view, in two directions at right angles to one another and in which both of said directions are at right angles to the parallel arranged wire ends at the wire setting zone. It is preferred in accordance with the present invention that the code rod positioning means be actuated by power from a conventional power drive roll as aforesaid, but under the control of coded means, which in a preferred form includes two groups of movable members, there preferably being four members in one group capable of moving the code rod or rods axially by increments of 1, 2, 4 and 8 times the mini-

um axial movement increment and two members in the other group which are jointly and severally capable of moving each code rod by rotational increments, for example, of 90° each with a maximum amplitude of rotational position of 270°. Superimposed upon these code rod positioning means is preferably a seventh movable member for shifting the code rod means by an unequal multiple of the increment of movement in one direction, for example, by 45° of rotation where the increment of rotational adjustment is 90°. This is preferably arranged to bring a complete new set of wire positioning portions of the code rod into alignment with the wires to be positioned, so as to position the wires for upper case characters, on the one hand, and the lower case on the other. The seven movable members above defined may be actuated under the control of manually depressible keys, which in turn mechanically control the flow of power from the power drive roll to the several movable members in accordance with a predetermined code. Alternatively, the several movable members may be actuated by the power drive roll under control of electrical means as solenoids, which in turn are controlled electrically by respective control circuits. Under such circumstances the circuits may be actuated by contacts arranged to be made in accordance with a predetermined code by the depression of manually depressible keys. Alternatively, the several circuits aforesaid may be actuated by any remote control means capable of circuit actuation in accordance with a multiple digit code, as is well known in the art.

Other and more detailed features of the invention will be apparent from the following description and will be pointed out in the appended claims, all when considered in conjunction with the accompanying drawings, which disclose, by way of example, two embodiments of the principles of the invention.

In the drawings:

Figure 1 is a view partly diagrammatic and partly in side elevation illustrating a typewriter construction provided with a mechanical means for positioning a code rod for the setting of wires for wire printing, some features being omitted for clearness of illustration;

Fig. 2 is a fragmentary detailed view showing certain additional parts of the construction on a somewhat enlarged scale with respect to Fig. 1 and substantially on the line 2—2 of that figure;

Fig. 3 is a fragmentary detailed view taken substantially on the line 3—3 of Fig. 1 and on an enlarged scale showing some of the actuating mechanism for certain of the movable members;

Fig. 4 is a fragmentary detailed view illustrating the construction and mode of operation of the means for relatively moving the code rod means and the wire ends;

Fig. 5 is a fragmentary detailed view illustrating the operation of a part of the code rod rotation positioning means responsive to the second group of movable members and further illustrating the rotation positioning means for upper and lower case selection;

Figs. 6 and 7 are similar views each in fragmentary vertical section illustrating the manner in which wires are positioned by relative movement of a code rod and the wire end;

Fig. 8 is a fragmentary detailed view illustrating substantially in elevation the operation of the printing head and the contact for causing the resetting of the wires following the printing of a character;

Fig. 9 is a fragmentary face view of the cluster of wire ends at the printing head, the view being taken substantially on the line 9—9 of Fig. 8;

Fig. 10 is a view generally similar to a portion of Fig. 1 showing a modified form of the invention, in which the movable members are positioned electrically by solenoids and in which the character keys are effective to control the electric actuation of these solenoids;

Fig. 11 is a fragmentary detailed view similar to Fig. 5 but adapted to the form of the invention shown in Fig. 10;

Fig. 12 is a fragmentary detailed view similar to Fig. 4 but adapted to the form of the invention of Fig. 10;

Fig. 13 is a fragmentary detailed view substantially in vertical section and similar to Figs. 6 and 7, but adapted to the form of the invention of Fig. 10; and

Fig. 14 is a diagrammatic showing of an electric circuit for the form of the invention of Figs. 10 to 13.

Considering now the embodiment of the invention which is shown in Figs. 1 to 9, inclusive, of the accompanying drawings, there is illustrated a typewriter apparatus which may be assumed to be conventional or constructed in any desired manner, for example, as present commercial power operated typewriters, with the exception of the particular parts hereinafter specifically described. As a result, there has been no attempt to illustrate in detail the entire construction of the typewriter apparatus or the particular construction of any portions of the device which are not directly tied to the present invention.

As shown, for example, in Fig. 1, there is a frame or housing generally indicated at 20 including a laterally movable carriage 21 carrying the usual rotatable platen 22. The construction of all these parts may be considered essentially conventional. There is also illustrated in many figures of the drawing a continuously rotating power drive roll 24, which is also conventional in many commercial typewriters of the power drive type. The roll 24 is rotated continuously in the direction of the arrow shown in the several figures by suitable motor means (not shown). This roll corresponds, for example, to the roll 24 shown in the patent to Von Reppert, No. 2,379,843, granted July 3, 1945, and also to equivalent means shown in many other patents.

The typewriter apparatus illustrated is provided with the usual alphabetical or numerical keys 25 hereinafter referred to generically as "character keys." The several keys are mounted and arranged for selective manual operation by depressing each key in a substantially conventional manner. As shown, for example, one of these keys is carried by a key lever 26, which is pivoted on a suitable transverse rod 27 mounted in a part rigid with the frame of the machine. The key lever 26 has a downwardly extending projection 28 having a bifurcated end arranged to embrace a transverse pin 29 carried by and projecting from a cam latch trip lever 30. This trip lever, when moved clockwise about its pivot 31, is arranged to release a rotatable cam member 32 for engagement with the power drive roll 24, this engagement being facilitated by a torsion spring (not shown), which is adapted to rotate the cam member 32 by a small amount in a clockwise direction, as seen in Fig. 1, to bring a roughened or knurled portion thereof into contact with the periphery of the drive roll 24. This construction also is entirely conventional in many commercial power driven typewriters now in common use and is shown also, for example, in the von Reppert patent aforesaid.

It will be understood that there are a plurality of units corresponding to each of the character keys 25 respectively and each of which includes a rotatable cam member as 32, the units generally being designated at 33, Fig. 2, and being arranged in staggered relation on both sides of the power drive roll 24, as particularly shown in Fig. 2. It will further be understood that certain of the keys 25 have their key levers so arranged as to trip cam units on the right hand side, as seen in Figs. 1 and 2, of the roll 24, while other keys are arranged to cooperate with the cam units on the left side of this roll.

Tracing now the operation of the device through a cam unit on the left side of the machine operated by the key lever 26 shown in Fig. 1, the cam unit 33 as a whole is mounted upon a rockable lever device generally indicated at 34 and pivoted on a transverse rod 35, which in turn

is secured to a part fixed with respect to the frame of the machine. Thus, when the rotatable cam member 32 is released by the trip lever 30 as above set forth, the engagement of this rotatable member with the driven roller 24 will result in rocking the entire device 34 about the axis of the pivot rod 35 in a clockwise direction, as seen in Fig. 1.

At its outer end, each lever device 34 is pivoted as at 36 to a substantially vertically movable notched slide member 37. Thus, when the lever device 34 is actuated as aforesaid, it will result in moving the slide member 37 upwardly, as seen in Fig. 1. As shown, this slide member has six notches formed therein, three on each side, and the shoulders provided by the respective notches are arranged for cooperation with a corresponding number of rocker bails 38, 39, 40, 41, 42 and 43, which are mounted for rocking movement respectively about horizontal axes indicated by center shafts as shown at 44, 45 and 46 for rocker bails 38, 39 and 40 respectively, these shafts further being shown in Fig. 3.

The rocker bails 38 and 41 are shown in plan in Fig. 2, which also shows some portions of the rocker bails 38' and 41' associated with the cam units 33 to the right of the power drive roller 24 of Fig. 1. Certain of the rocker bails are provided with cut out portions opposite certain of the notched portions of different slide members 37 in accordance with a predetermined code. Thus, when a particular slide member 37 operated by a particular character key is caused to move upwardly in the manner previously described, it will move certain ones of the rocker bails in accordance with the code equivalent of the particular character key actuated. As there are six rocker bails, all associated with the slide members 37 in prolongation of the one shown in Fig. 1, it will be seen that each character key can actuate certain of the six associated rocker bails in accordance with a six element code. Inasmuch as different codes may be chosen which will give desired results, no one particular code will be set out in detail herein, but it will be understood that a different combination of the six elements of the code is arranged to stand for each of the character keys respectively.

Also, as certain of the keys 25 are arranged to operate cam units 33 to the right of the power drive roller 24 as shown in Figs. 1 and 2, a duplicate set of equipment including trip levers 30', lever devices 34', slide members 37' and rocker bails 38', 39', 40', 41', 42' and 43' are provided, equivalent respectively to the structures identified by the corresponding unprimed numbers and previously described. Inasmuch as this equipment is merely a duplication of the equipment previously described in detail, it will not be further described.

It is desired to operate six horizontally movable members shown at 47, 48, 49, 50, 51 and 52 (Fig. 2) in response to actuation of the six rocker bails 38 to 43. The arrangements for accomplishing this purpose are as follows. The shaft 46, as shown in Figs. 1 and 3, is provided with a downwardly extending lever 53 secured thereto and pivoted to the movable member 48 as shown at 54. The shaft 45 is provided with a laterally extending lever 55, which is connected by a short link 56 to a bell crank lever 57 loosely pivoted on the shaft 46 and having its other arm extending downwardly and pivoted to one of the movable members such as the member 50. The uppermost shaft 44 has a laterally extending lever 58 secured thereto which is connected by a vertically disposed link 59 to a laterally extending portion of a bell crank lever 60 also loose on the shaft 46 and having a downwardly extending arm pivoted to one of the movable members, as the member 52.

In a similar manner the rocker bails 41, 42 and 43 are articulated to and arranged to operate the longitudinally extending movable members 51, 49 and 47, respectively, the means for this purpose being the mechanical equivalent in each instance of the means shown

in Figs. 1 and 3 and previously described in some detail.

It will be understood that the mechanism shown at the right of the power drive roller 24 and including the notched slides 37' and the rocker bails 38' through 43', inclusive, is also mechanically connected to movable members 47 to 52 in a manner exactly similar to the manner of connecting the corresponding rocker bails previously described. The several parts are given the same reference characters as the corresponding parts respectively, but with a prime mark added.

The movable members 47 to 52, inclusive, are arranged to position one or more code bars so as in turn to control the longitudinal positioning of selected ones of a group of wires, which in turn are effective to print a character corresponding to that desired. The embodiment of the invention shown in Figs. 1 through 9 is essentially a mechanical type arrangement in which the power effective to position a single code rod, in this instance, is derived from the power drive roller 24 through the mechanism previously described to position the movable members 47 to 52, inclusive, respectively in accordance with a desired code for each character key, so as in turn to transmit force for positioning the code rod in each of two directions substantially at right angles to each other and particularly both substantially at right angles to the direction of the ends of the wires to be positioned.

The arrangement shown in the accompanying drawings is one in which there is but a single code rod shown at 61, which in this instance is in the form of a hollow cylinder and is positionable in two directions with respect to the wire ends to be actuated or positioned thereby. As shown particularly in Figs. 6 and 7, the wire ends are arranged parallel to one another and all substantially vertical in a single line. The code rod 61 is movable in a direction parallel to that line, i. e. axially of the cylindrical shape thereof. It is also rotatable about its own axis. The movable members 47 to 52, inclusive, are arranged as hereinafter particularly described to position the code rod both axially and rotatably, in other words in two directions at substantially right angles to one another, so as to bring into alignment with the wire ends suitable coded portions of the code rod. It will be understood that if desired more than one code rod could be used, for example, two or more, and the means for operating the single code rod of the present invention could be duplicated to the extent necessary so as to operate both or all the code rods provided simultaneously as to their axial and rotative positioning. It will be further understood that while a substantially cylindrical code rod is shown here, this arrangement is one of convenience only, as any code rod equipment which provides a surface movable in two directions at substantially right angles to one another and wherein the surface is provided with properly coded depressions (or holes as shown) and undepressed portions would be effective to carry out the present invention.

Further, while it is conceivable that coded elements such as the movable members 47 to 52 may be used, greater or less in number than six, and while any desired ones or number of these could be used to position the code rod means axially, with the remainder to position this code rod means in a transverse or rotative direction, the present arrangement shows the provision of means by which four of the six movable elements 47 to 52 are used to position the code rod 61 in an axial direction, for example, in increments of 1, 2, 4 and 8 times a predetermined unit increment of axial movement, while the other two movable elements of the members 47 to 52 are arranged to control the rotative positioning of the one or more code rods 61 provided. Thus, for example, one of the movable members 47 to 52, as the member 47, is connected to a lever 62 (Fig. 1) which is pivoted on a fixed pivot shaft 63 and has its other end connected to a wedge member 64. Another one of the movable members 47 to

52, as the member 48, is connected to a lever located immediately behind the lever 62, as seen in Fig. 1, and which is also pivoted on the shaft 63 and is connected intermediate its ends at 65 to a wedge member 66. In each instance the linkage may be such as to give 2:1 ratio of movement between the movement of the actuating movable members 47 to 52 on the one hand and the movement of wedge members respectively on the other. In a similar way another one of the movable members 47 to 52, as the member 49, is connected to a lever 67 pivoted on a fixed pivot shaft 68 and connected to a wedge member 69. A fourth one of the movable members 47 to 52, as the member 50, is connected to a lever immediately behind the lever 67 as seen in Fig. 1 and also pivoted on the shaft 68 and which is connected to operate a wedge member 70. If these wedge members are then so contoured as generally taught, for example, in the patent to Johnson, No. 2,524,127, granted October 3, 1950, and shown on Figs. 6 and 7 of that patent, then it will be possible to move the upper ends of one or more of the stacks of wedge and roller members 71 and 72 upwardly by amounts proportioned to the coded amounts for the respective movable members 47, 48, 49 and 50 operating these stacks. As shown, the stacks 71 and 72 are preferably mounted so that their lower ends (not shown) are fixed in position. The upper movable ends of these stacks are connected together by a pivoted cross link 73, a center point of which is pivoted at 74 to a lever arm 75 which is pivoted at 76 on a transverse shaft. Arranged for movement with the lever arm 75 about the pivot 76 is a downwardly extending lever arm 77, the lower end portion of which is swivelly mounted at 78 to a rearwardly extending actuating rod 79, which in turn is arranged to carry and to move the code rod 61 in an axial direction. It will be understood that the connection at 78 is one permitting free rotation of the actuating rod 79, while controlling the longitudinal positioning thereof. Suitable means, such as a spring 80, may be arranged to oppose the movement hereinabove described and to restrict the position of the code rod to a normal initial position furthest to the right as seen in Fig. 1 once the force effective to position it otherwise has been released. As stated hereinabove, the several movable members which are connected to the wedge means of the stacks 71 and 72 are preferably arranged to move the code rod axially in amounts equal to 1, 2, 4 and 8 times a unit increment of movement, respectively so as to provide in four elements of the six element code for a desired number of different axial positions of the code rod means. In the event that more than one code rod is used, all such code rods are arranged to be simultaneously positioned in an axial direction by the means described including the lever arm 77.

The other movement of the code rod means, i. e. the rotative movement, is actuated by a third wedge and roller stack generally indicated at 81 in Fig. 5. As shown in this figure, one of the movable members, for example the member 51 indicated in that figure, is connected to a lever 82 corresponding generally to the lever 62 of Fig. 1 and pivoted on a stationary transversely extending shaft 83. The upper end of this lever is connected to a wedge means 84. Similarly, another one of the movable members, for example the member 52, may be connected to a lever immediately in rear of the lever 82 as seen in Fig. 5 and also pivoted on the transverse shaft 83 and which is connected intermediate its ends to a wedge means 85 in the same way previously described. In this instance, the upper end of the wedge and roller stack 81 is fixed, so that the lower end is moved upwardly or downwardly in accordance with the positioning of the wedges, suitable means (not shown) such as springs being used resiliently to oppose movement of the lower end of the stack. As shown, the

lower end of the stack 81 is provided with a rack member 86 arranged to mesh with and rotate a pinion 87 carried by the rod 79 and of such length that it will always mesh with the rack 86 irrespective of the axial positioning of the code rod 61 by the means previously described.

The rotative means just described is preferably arranged to move the code rod means, in this case the cylindrical code rod 61, in increments of movement, for example, of 90° with a total amplitude of movement of 270°.

In order that the typewriter device of the present invention may be arranged for printing both upper and lower case characters in a manner corresponding to conventional typewriters, there is provided a shift key and associated mechanism which is effective to rotate the code rod means through an angle different from the angular increments of rotation above described, and preferably about 45°. This 45° movement may be superimposed upon the depression of the coded character keys, so as to bring an entirely new set of depressions and undepressed portions of the code rod means opposite the wire ends.

For this purpose there is provided, as shown best in Fig. 5, a shift key 88 mounted upon a key lever 89, which in turn is pivoted on the shaft 27 or some stationary pivot means. The key lever 89 has a downwardly extending portion 90 having a bifurcated end shown at 91 to embrace a pin 92 carried by the upper end portion of a trip lever 93, which is similar in construction and mode of operation to the trip levers 30 and 30' previously described. The trip lever 93 is arranged, when actuated by the depression of the shift key 88, to release a cam member 94 and permit it to be brought into engagement with the power drive roller 24 by a torsion spring (not shown), but which is conventional in apparatus of this type. Engagement of the cam member 94 with the power drive roll is effective to move a lever 95 counterclockwise about its pivot shaft 96, as seen in Fig. 5. The lever 95 is connected through a link 97 with the upper end portion of a lever 98 pivoted at 99 and connected at its lower end to a wedge means 100, which is effective to move the wedge stack 81 so as to rotate the code rod means through a predetermined angle, for example 45°, through the rack 86 and pinion 87 as aforesaid. It will be understood that suitable spring means (not shown), preferably in the form of one or more heavy springs, are arranged in conjunction with the wedge and roller stack 81 for returning the elements of this stack and the code rod 91 rotatably positioned thereby to their initial position once the wedge means have been returned to their respective initial positions; and further, that other spring means (not shown) are arranged to return the respective wedge means to their initial positions once they are released by the respectively associated cam means by which they were actuated. Inasmuch as all these means are essentially conventional and within the ability of those skilled in the art to provide as and where necessary, they are not shown in detail herein.

It may now be assumed that the code rod means including the one or more code rods 61 provided as aforesaid have been positioned at the proper position both longitudinally and laterally (by rotation) in order to position the printing wires for the printing of a desired character, be it an upper or a lower case character. The next operation which must be done is to set the wires to be used in the printing of the character in question by a longitudinal movement of certain of these wires, the proper ones to print the character desired. For example, if it be desired to print the letter A and if there are a group of wires as particularly shown in Fig. 9 arranged, for example, in seven vertical rows of five wires each, the wires shown with darkened ends in Fig. 9 are the ones to be projected forwardly of the other wires, so as to print the desired character. Other combinations, such

for example as those shown in the Johnson Patent No. 2,524,127 aforesaid, particularly in Fig. 8 of that patent, may be used for printing other letters and characters. The setting of the wires is effected from a general point of view by a relative motion toward one another between the code rod means and the wire ends. This will result, as shown in Figs. 4, 6 and 7, in moving certain wires upwardly (Fig. 6) where the ends thereof are opposite undepressed portions of the code rod means; and in making no change in the position of other wires (Fig. 7) where the ends are opposite depressions or holes in the code rod means.

Turning now to the details of the particular form of apparatus shown in the accompanying drawings, each of the wires 101 is arranged to pass freely through a hole in a fixed plate 102. Each wire has affixed to its lower end an inertia block 103 which is arranged to be vertically slidable in suitably shaped guideways in a housing and in a slide member 104, the slide member 104 being common to a number of wires which are in alignment with one another and are one behind another in the views shown in Figs. 6 and 7. The wires pass downwardly as indicated in dotted lines in Fig. 1 and may be arranged in one or more rows depending upon the number of code rods actually used. As shown in the accompanying drawings, there is but one code rod 61, so that all the wires will be assumed to be arranged with their lower ends in a single vertical plane, this plane being arranged to contain the axis of the code rod 61. The wires at the start of the operation are in the position shown in Fig. 7 and certain of them may be moved from that position, for example, to the position of the parts shown in Fig. 6 by engagement between the respective wire ends at 105 with undepressed sections 106 respectively of the code rod 61. If, however, a depression, or in the present instance a hole, is located opposite the end of a particular wire, such as that shown in Fig. 7, relative movement between such wire end 105 and the code rod 61 in a vertical direction as seen in Figs. 6 and 7 and in a vertical direction in the apparatus as presently disclosed will result in no movement of the respective wire, the wire end passing freely through an aligned hole as at 107.

While it is considered that the results just described of positioning the wires in directions longitudinally thereof respectively could be effected by any relative movement between the wire ends 105 on the one hand, and the code rod 61 on the other, the apparatus illustrated in the accompanying drawings is arranged to move the code rod means vertically, while retaining the wire ends stationary, except for the movement thereof incident to impingement against undepressed portions of a code rod, as shown in Fig. 6. Thus, the code rods are moved, as shown in Figs. 6 and 7, from the position indicated by the dotted outline to the full line position thereof shown in these figures. This movement is effected by power derived from the power drive roll, which is caused to act at a predetermined time after the mechanical impulses have been transmitted to position the code rod as aforesaid.

For this purpose, each of the lever devices 34 or 34' is provided with an extended actuating portion as shown at 108 in Fig. 4, the lower edge of which is positioned a predetermined distance above a lower flange 109 of a bail 110. The bail 110 is mounted for substantially vertical movement, for example, by being held in two or more levers 111 pivoted on the transverse rod 35. Carried rigidly with the bail 110 and lever 111 is a rearwardly extending lever portion 112 having a bifurcated end 113 for engaging a pin 114 of a trip latch 115 controlling a cam device 116 which is rotatably carried by a lever 117 pivoted at 118.

Thus, when any of the lever devices 34 is actuated as aforesaid by a character key for initiating an operation of positioning the code rod means, all as above described, there will be a certain delay period until the lower edge portion of the actuating portion 108 engages

the flange 109. This time delay is calculated to be sufficient in practice to permit the positioning of the code rod 61 prior to the actuation of the code rod raising means hereinafter particularly described incident to the operation of the cam member 116. This means operates in a substantially conventional manner which will now be obvious from the drawings and the description, the trip latch 115 releasing the cam device 116 to move into engagement with the power drive roll 24. Once this engagement has been started, the rotation of the cam member 116 by the power drive roll will result in the counterclockwise movement (as seen in Fig. 4) of the lever 117 about its pivot shaft 118 against the tension of a spring 119. A suitable stop (not shown) prevents excessive clockwise movement of the lever 117 under the tension of the spring 119 so that the cam device 116 will engage the roll 24 only when released by the actuation of the latch 115 as aforesaid. Counterclockwise movement of the lever 117 will move a wedge slide 120, pivoted to the lower end of the lever 117, to the right, as seen in Fig. 4, and cause wedge means 121 thereon to ride under rollers 122, which are mounted on a carriage 123 in which the code rod 61 is mounted for longitudinal and rotative movement. It will be understood that the actuating rod 79 for the code rod 61 is sufficiently flexible to permit this movement without rotating the code rod incident to relative movement between the pinion 87 and the rack 86. Thus, the code rod, which need only be raised a very small amount to effect a positioning of the wire ends, is raised due to the rollers 122 riding up on the wedge means 121, so as to move the entire code rod means upwardly without otherwise changing the position thereof and so as to move certain of the wires forwardly in accordance with the particular code combination being applied, so as to position the forward ends of these wires, for example as shown in Fig. 9, to print a desired character. Once the cam device 116 has been rotated through substantially 180°, the engagement thereof with the power drive roll 24 will cease and the only force effective upon the lever 117 will then be that of the spring 119, which is effective at this time to retract the wedge slide 120 and to permit the downward movement of the code rod means to its initial position.

The next operation to be effected is to move a printing head 124, such as that shown in Figs. 8 and 9, forwardly to cause the wires 101 which have been projected as aforesaid to engage either the paper to be printed or a conventional ribbon, so as to print the desired character in a more or less conventional manner. For this reason the printing head 124 is mounted on an arm 125 of a bell crank lever pivoted on a transverse shaft 126 and arranged to engage the platen 22 and paper or other material thereon in a conventional way. It will be understood that the several wires 101 are disposed with their upper ends at the printing head 124, for example as shown in Fig. 9, and pass therefrom through a tube 127 (Fig. 1) and thence through suitable means restricting these wires to longitudinal movement respectively.

Once the proper wires to print a character have been positioned as aforesaid, it is necessary to move the printing head forwardly by clockwise movement of the lever 125 as seen in Fig. 8. For this purpose, means are provided, actuated by the means for positioning the wires, in other words, by the lever 117 (Fig. 4). This lever carries a laterally projecting portion 128 which is arranged to engage the lower end of a trip lever 129 after the lever 117 has moved sufficiently to assure the completion of the operation of setting the wires. The trip lever 129 is arranged to release a rotatable cam 130, Fig. 8, for engagement with the power drive roll 24 in a manner similar to that in which other rotatable cams previously described are arranged to operate. The cam 130 is carried by the lower end of a lever 131 which

may also be mounted upon the shaft pivot 118 and which has rigid therewith a rearwardly projecting portion 132, the rear or outer end of which is pivoted at 133 to a link 134, which is also pivoted at its upper end to a forwardly projecting arm 135 of the bell crank lever 125. Thus, the printing head 124 will be actuated by power derived from the power drive roll 24 at a time a sufficient interval after the initiation of the raising of the code rod, so that the wires will have been positioned prior to the movement of the printing head 124. It will be understood that once the cam 130 has made a half revolution, the printing head will be retracted under the influence of suitable spring means (not shown) in readiness for resetting the wires 101 and printing the next character.

The next and last operation which must be effected in the present device is that of resetting the wires in their initial retracted position (with respect to the printing head), which is preferably accomplished by electrical means shown in part only and responsive to the completion of the forward movement of the printing head in printing a character. When the printing head 124 is moved forwardly by clockwise movement of the lever 125 (as seen in Fig. 8), a rear portion 135 of this lever will engage a movable electrical contact of a contact pair 136 to complete a circuit to solenoid means (not shown), which is arranged mechanically to move the slide 104 downwardly to move the wires 101 and their inertia blocks 103 from the position shown in Fig. 6 to the position shown in Fig. 7, which is the normal position thereof. The slide 104 is then returned by spring means (not shown) to its normal position shown in both Figs. 6 and 7. The slide 104 has at its upper edge an intumed flange 137 adapted to overlies all the inertia blocks 103, so that after the wire ends and the code rod have been separated by relative movement therebetween, with the code rod returning, for example, to the position shown in dotted lines in Figs. 6 and 7, the flange member 137 will engage the upper end portions of the blocks 103 of each of the wires which has been moved upwardly (as seen in Fig. 6 as aforesaid) and will move these blocks and consequently the wires 101 carried thereby respectively to the initial position of these weights and wires shown in Fig. 7. This is effected by an instantaneous actuation of the solenoid means associated with the slide 104; following which the slide and the actuating solenoid means therefor are returned to the normal initial position of these parts shown as to the slide 104 in Fig. 7. Meanwhile, the several cams have completed their cycles of operation and have been moved to their respective inoperative positions, so that all the parts are now returned by suitable associated springs, only a few of which are shown in the drawings, to their initial positions in readiness for actuation to print a next succeeding character.

It will be understood that lateral spacing of the platen may be accomplished by means conventional in power operated typewriters in the prior art and actuated following the completion of the printing of a character, for example, by electrical means initiated in their operation by the closing of the contacts 136, Fig. 8. Carriage return and other conventional typewriter functions may be operated as is conventional in power operated typewriters now commercially available.

In Figs. 10 to 13, inclusive, of the accompanying drawings are shown portions of a modified form of the device in which electrical means are used to control the actuation of the movable members 47 through 52 by the continuously rotating power roll 24 in lieu of the more strictly mechanical means shown and described with respect to the preceding figures. In addition, a means for translating the movement of each of a plurality of character keys as are provided on the conventional typewriter into a six unit electrical code is provided

in conjunction with this form of the device. There is further illustrated in Fig. 14 an electric circuit by which the character keys are arranged selectively to energize certain of a plurality of relays, there being six relays corresponding to the six elements of the code as disclosed for the preceding form of the invention. The relays in turn control the energization of solenoid means which control power operated cams respectively for controlling the movement of the members 47 to 52, inclusive.

It will further be understood that if desired the electrical means actuated by the character keys of this form of the invention could be used to control the operation of a plurality of typewriters, each corresponding generally to that hereinafter particularly described. In a more or less similar manner, a six digit code can be arranged to actuate the present typewriter of the type illustrated in Figs. 10-14 whether that code be derived directly from the operation of character keys on this or another machine, or whether the relays actuated by and in accordance with the electrical pulses in a six digit code be actuated in fact by remote control or possibly by a tape or otherwise. All these modifications will occur to those skilled in the art from the description presently given of this semi-electrical form of the present invention.

Turning now to the form of the invention shown in Figs. 10 to 14, and particularly to Fig. 10, there are a plurality of character keys 25 each carried by a key lever 26 pivoted on a transverse rod 27 as aforesaid. Each key lever has a downwardly projecting portion 28 having a bifurcated lower end to embrace a laterally directed pin 29 of a trip lever 30 mounted for rocking movement on a pivot 31. Associated with the trip lever 30 is a rotatable cam 32 all as aforesaid. The cam 32 is a part of a unit generally designated as 33 and including a bell crank lever 34 pivoted on a transverse rod 35. It will be understood that there is a unit 33 corresponding to each of the character keys as in the form of the invention illustrated in previous figures and that these units are preferably arranged in staggered relation both in front of (to the left, Figs. 1, 2 and 10) and in rear of (to the right, Figs. 1, 2 and 10) the power drive roll 24. As far as possible in describing this figure the same reference characters will be used so as to indicate the similar portions of the two forms of the device.

Each lever device 34 has connected thereto at its outer end and depending therefrom a slide member 138 for the units 33 on the left of the roll 24, Fig. 10, and 138a for those units on the right of the roll 24 (these units not being shown in full for clarity of illustration of other parts). Each slide member 138 has secured thereto a plurality of laterally extending buttons 139 of insulating material. Associated with certain of these buttons, the number and arrangement depending upon the particular code in use, are a number of spring contact members 140, each of which is mounted in a fixed manner at the right as seen for the group cooperating with slide member 138, and which are normally held spaced away from a corresponding number of stationary contacts 141 respectively, the arrangement being such that when the lever device 34 is moved clockwise about the pivot 35, the slide member 138 is positively moved upwardly, permitting the resilient spring action of the contact members 140, which are provided in association with this particular slide member, to move them upwardly and make contact adjacent to their left hand ends with the respective fixed contacts 141. Thus, there will be completed one or more circuits, which may total six or more in number, and which may be arranged as better illustrated in the circuit diagram shown in Fig. 14 to close the circuit to respectively corresponding relays, the several relays shown in that figure being numbered R1, R2, R4, R8, R5 and R3. In Fig. 14, it will be seen that when the main power lines 142 and 143 are energized with suitable current, and bail contacts 144 hereinafter described are

closed, which is the normal condition for these contacts, a circuit may be completed from the line wire 142 through wire 145, closed contacts 144, wire 146, thence through whichever ones of the key contacts are closed in accordance with the code group corresponding to the particular character to be printed and through the respective relays to line wire 143. Each of the key contacts is represented in Fig. 14 by a contact member 147 arranged to connect a pair of contacts 148 and 149 which would complete a circuit, for example, through the relay R3. Once this circuit is completed, the relay is held closed by relay contacts R3A (i. e. the "A" contacts of relay R3 which are closed when the relay is energized), and which complete a holding circuit for the relay.

The device described, therefore, furnishes a means for translating the selective and substantially instantaneous depression of each character key into the proper combination of electrical pulses of a six member code, so as to close certain selected relays of the six provided. These relays operate through means hereinafter described to translate the electrical code responsive means into the operation of the mosaic character printing typewriter.

Turning now to the operation of the device in response to the closing of the one or more of the relays in question, there is provided a plurality of magnet means, four of which are shown as solenoids 150, 151, 152 and 153 (Fig. 10). These solenoids and two more, not shown in Fig. 10, but which are located in rear of some of the relays 150 through 153, are also shown on Fig. 14 in which the additional solenoids, 154 and 155, are also diagrammatically illustrated. Each of these solenoids (150-155) is individually mechanically connected as by a link 156 (Fig. 10) to a bell crank lever 157, a second arm of which acts as a trip lever for a rotatable cam 158, there being one such rotatable cam and associated mechanism for each of the six solenoids 150 to 155, inclusive, and each cam being mounted on and connected, as shown in Fig. 10, to operate a lever member 159 connected at its lower end to one of the longitudinally movable members 47 to 52 (Fig. 2), the connection shown in Fig. 10 being between lever 159 and the movable member 51. It will be understood that each of the movable members 47 to 52 operates in the same way respectively and through the same mechanism previously described in connection with the other form of the apparatus to effect first the positioning of the code rod means 61 in two directions at right angles to one another, so as to bring the code rod or code rods constituting the code rod means in position to set the wires for the printing of a selected character. Inasmuch as the same type means are used for these purposes, these means, to the extent that they are shown in Figs. 10 to 13, are given the same reference characters as in the previously described figures of the drawings.

There is further provided in a manner similar to that described with respect to the other form, a shift key (not shown in detail), but which is arranged to close a circuit through a shift relay R6 (Fig. 14), the circuit being closed by a key contact including a movable member shown diagrammatically at 160, arranged to make contact between points 161 and 162. Similarly, the "A" contacts of relay R6 (arranged to be closed when the relay is energized) constitute the essential elements of a holding circuit, so that this relay is held closed by a circuit through contacts R6A as shown in Fig. 14. This relay R6 also operates through its "B" contacts (R6B) to close a circuit through a solenoid 163 (Figs. 11 and 14). The solenoid 163 is mechanically connected through a link 164 to a bell crank lever 165 constituting a trip lever for a rotatable cam 166. This cam is mounted on the lower end of a lever 167 which will be rotated in a counterclockwise direction about its pivot 168 (as seen in Fig. 11) when the cam 166 is permitted to engage the power drive roll 24. Motion is transmitted from the lever 167 through a link 97 (as previously described, Fig. 5) to a lever 98 pivoted at 99

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and arranged to actuate a wedge means 100. This operates a wedge and roller stack 81 in conjunction with the other wedge means associated with this stack to move a rack 86 meshing with a pinion 87 on the actuating rod 79 of the code rod 61.

From the above, it will be seen that there is provided an electrically actuated means responsive to a seven element code for selectively actuating seven solenoids, which in turn control the transmission of mechanical power from the power drive roll 24 for positioning the code rod and thus for operating the machine through a series of functions equivalent to that effected mechanically in the first form of the apparatus.

Carrying the operation of this form through the next step, which is to effect a relative movement between the positioned code rod and the wire ends in order to set the wires, each of the levers 159 has a portion 108 projecting therefrom and arranged to cooperate with a flange 109 of a transverse bail 110, there being a sufficient distance between the lower edge of each projection 108 and the flange 109, so as to permit the substantial completion of the positioning of the code rod means prior to the actuation of the bail 110 for elevating the code rod in a manner substantially equivalent to that previously described. As shown particularly in Fig. 12, the bail 110 is carried on one or more levers 111 pivoted on the stationary transverse rod 35 and having a bifurcated outer end portion for embracing a transversely extending pin of a trip latch 115. This trip latch is effective, when released, to permit the rotatable cam device 116 to engage the power drive roll 24, so as to move the lever 117 in a counterclockwise direction (as seen in Fig. 12) about its pivot 118 and thereby to move the wedge slide 120 to the right (also as seen in Fig. 12). This is effective through the wedge means 121 and the rollers 122 carried by the code rod carriage 123 to raise the code rod 61 in the manner previously described.

This operation is also effective in this form of the invention to permit the separation of a pair of normally closed electrical contacts shown at 144 in Fig. 12 and corresponding to the similarly numbered contacts shown in Fig. 14. Thus, when the bail 110 has been lowered, so as to have initiated the raising of the positioned code rods, the contacts 144 are opened so as to open the circuit to all the relays R1, R2, R3, R4, R5, R6 and R8, some or all of which were previously closed incident to the positioning of the code rod. This brings the electrical circuit of Fig. 14 back to its original condition. The opening of the circuit through each of the several relays also causes the de-energization of those of the solenoids 150 through 155 and 163 which were energized and permits the mechanical parts which were moved thereby to return to their initial positions respectively under the force of suitable springs (not shown).

The remainder of the operation is substantially the same as previously described, it being noted that the solenoid used for moving the slide member or wire reset bail 104 following the printing of a character is indicated in Fig. 14 at 169, which is energized by the "B" contacts of a relay R9, this relay being closed by a circuit initially made by the engagement of a pair of contacts as shown at 136 (Fig. 8) and the circuit being first held through a pair of contacts R9A constituting a holding circuit for relay R9 (Fig. 14) (similar to those previously described). This circuit is eventually broken by the movement of the slide member 104 in resetting the inertia blocks 103 of the wires 101 by downward movement of the member 104 (Fig. 13). This downward movement operates as previously described for the correspondingly numbered parts of the previous form of the invention and is effective through a push rod 170 carried by the bail 104 and extending loosely through a hole in the fixed plate 102 to permit the opening of a pair of electrical contacts 171 (Figs. 13 and 14). Thus, when the bail 104

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is lowered for resetting the wires, the contacts 171 are permitted to open, which breaks the circuit through the relay R9 and hence permits the de-energizing of the solenoid 169, so that the slide member 104 may be returned to its normal inoperative position (at the top, as seen in Fig. 13) by suitable springs (not shown).

From the foregoing, the particular operation of the form of Figs. 10 to 14 should now be obvious.

It will be understood, however, that while these instrumentalities shown in Figs. 10 to 14 may be associated together in a single machine as shown, the electrical means including the several relays described or equivalent means may be actuated by suitable pulses either derived from the actuation of some other set of character keys which may be connected in parallel to operate a plurality of machines or, alternatively, from some electrical controlling means, for example, a tape or a series of perforated cards, so as to cause the present machine to print a succession of characters substantially automatically and in response to mechanical power derived from a continuously operating power drive roll as shown at 24. Furthermore, the means herein shown and described for closing circuits through a plurality of relays in accordance with a predetermined code in response to the depression of selected character keys may be used in accordance with the present invention for operating one or more typewriters as herein described.

While there are illustrated in the accompanying drawings and there have been described two principal forms of the invention and other modifications have been suggested as the description proceeded, it is intended that the present invention shall embrace all other equivalents of the subject matter particularly described which may suggest themselves to those skilled in the art from the foregoing disclosure. The invention, therefore, is intended to be limited only by the appended claims which are to be construed validly as broadly as the state of the art permits.

What is claimed is:

1. In a wire printing typewriter, means for confining a group of wires at one end thereof in a movable character printing head, means adapted to support printing wires in said head for free, solely-longitudinal movement relative to each other, printing wires supported in said head as aforesaid, said wires having their opposite remote ends arranged in predetermined substantially parallel positions respectively in a wire setting zone, a wire setting device in said zone, comprising code rod means including at least one code rod opposite the remote ends of said wires at said predetermined positions respectively, each said code rod comprising a member having a predetermined arrangement of depressions therein and capable of positioning movement in two directions at substantially right angles to each other and both at substantially right angles to the parallel ends of said wires to bring certain of said depressions into alignment with the remote ends of certain of said wires respectively in accordance with a predetermined code, means for relatively moving said code rod means and said wires in a direction longitudinal of said wires, so as to set certain of said wires in accordance with the character to be printed, a continuously rotating power drive roll for said typewriter, means actuated by said power drive roll for relatively moving said code rod means and the remote ends of said wires as aforesaid, character selecting means, other means controlled by said character selecting means and actuated by said power drive roll for positioning said code rod means in one direction, further means controlled by said character selecting means and actuated by said power drive roll for positioning said code rod means in a second direction at substantially right angles to the first named direction, means actuated by said power drive roll after said code rod means has been positioned and said wires set for moving said printing head to print a character, and means initiated in its

operation by the completion of the movement of said printing head in printing a character for retracting the wires in said head which were projected to print a character to a uniform retracted position in readiness for the next wire setting operation for printing a succeeding character.

2. A wire printing typewriter in accordance with claim 1, comprising in addition, a plurality of character keys adapted for selective manual operation, and means controlled by said character keys respectively and utilizing power from a source other than that serving to depress any of said character keys for controlling said character selecting means.

3. In a wire printing typewriter, means for confining a group of wires at one end thereof in a movable character printing head, means adapted to support printing wires in said head for free, solely-longitudinal movement relative to each other, printing wires supported in said head as aforesaid, said wires having their opposite remote ends arranged in predetermined substantially parallel positions respectively in a wire setting zone, a wire setting device in said zone, comprising code rod means including at least one code rod opposite the remote ends of said wires at said predetermined positions respectively, each said code rod comprising a member having a predetermined arrangement of depressions therein and capable of movement in two directions at substantially right angles to each other and both at substantially right angles to the parallel ends of said wires to bring certain of said depressions into alignment with the remote ends of certain of said wires respectively in accordance with a predetermined code, means for relatively moving said code rod means and said wires in a direction longitudinal of said wires, so as to set certain of said wires in accordance with the character to be printed, a continuously rotating power drive roll for said typewriter, means actuated by said power drive roll for relatively moving said code rod means and the remote ends of said wires as aforesaid, character selecting means, other means controlled by said character selecting means and actuated by said power drive roll for positioning said code rod means in one direction, further means controlled by said character selecting means and actuated by said power drive roll for positioning said code rod means in a second direction at substantially right angles to the first named direction, and means actuated by said power drive roll after said code rod means has been positioned and said wires set for moving said printing head to print a character, said character selecting means comprising two groups of movable members, each of which groups consists of a plurality of movable members and each of the members of each said group being movable between two terminal positions respectively, the first of said groups comprising a plurality of members constructed and arranged to control the positioning of said code rod means in one direction and the second of said groups comprising a plurality of movable members constructed and arranged to control the positioning of said code rod means in said second direction at substantially right angles to the first named direction as aforesaid.

4. A wire printing typewriter in accordance with claim 3, in which each said code rod constitutes a member of substantially cylindrical contour which is movable axially and is also rotatable about its axis, the movable members of said first group being constructed and arranged to move each said code rod axially by a number of increments depending upon which of said members are moved from one of their two positions to the other, and in which the movable members of said second group are connected to rotate each said code rod by a number of predetermined increments in accordance with the positioning of the members of said second group at one of their two positions or the other.

5. A wire printing typewriter in accordance with claim 4, in which said first group of movable members consists

of four similar members constructed and arranged to be selectively usable to give 1, 2, 4 and 8 times a predetermined unitary increment of movement axially to each said code rod, and in which said second group consists of two members constructed and arranged to control the rotational positioning of each said code rod in increments of 90° and with a maximum amplitude of rotational positioning of 270°.

6. A wire printing typewriter in accordance with claim 5, comprising in addition, a seventh movable member not included in either the first or the second group aforesaid, means for moving said seventh member when it is desired to shift from one case to the other in the printing of characters, and means controlled by said seventh movable member and actuated by said power drive roll for rotating said code rod through substantially a 45° angle, so as to bring into alignment with the wire ends a complete new set of coded depressions dependent upon the positioning of each said code rod under the control of the first and second group of movable members.

7. A wire printing typewriter in accordance with claim 3, in which the operation of said means for relatively moving said code rod means and said wires is initiated after a predetermined time delay following the operation of positioning said code rod means as aforesaid, so that the positioning of said code rod means will be completed prior to said relative movement between said code rod means and said wires for setting certain of said wires selectively.

8. A wire printing typewriter in accordance with claim 3, comprising in addition, a plurality of character keys adapted to be selectively manually depressed for controlling the operation of said wire printing typewriter in printing corresponding characters respectively, code means controlled in accordance with a predetermined code by said keys respectively for controlling the operation of said movable members by power applied from said power drive roll to move predetermined ones of said movable members for each key respectively from one position of the respective movable members to the other position thereof, and means articulated to said movable members and including wedge means for mechanically positioning said code rod means in response to the mechanical movement of selected ones of said movable members, whereby power for positioning said code rod means is transmitted from said power drive roll through the ones of said movable members selectively responsive to each character key respectively and through said wedge means.

9. A wire printing typewriter in accordance with claim 3, comprising in addition, a plurality of character keys adapted to be selectively manually depressed for controlling the operation of said wire printing typewriter in printing corresponding characters respectively, code means controlled in accordance with a predetermined code by said keys respectively for controlling the operation of said movable members by power applied from said power drive roll to move predetermined ones of said movable members for each key respectively from one position of the respective movable members to the other position thereof, means articulated to said movable members and including wedge means for mechanically positioning said code rod means in response to mechanical movement of selected ones of said movable members, whereby power for positioning said code rod means is transmitted from said power drive roll through the ones of said movable members selectively responsive to each character key respectively and through said wedge means; a case shift key, and means controlled in its operation by said case shift key and actuated by power from said power drive roll for moving said code rod means in one of said two directions by an increment which is an uneven multiple of the increments of movement of said code rod means by those of said movable members which move said code rod means in the same sense, so that said code rod means may be provided with two complete sets of wire setting means, one for upper

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case characters and one for lower case characters, and said case shift key may be effective to bring one or the other of said two sets into position, to be determined by the first and second of said groups of movable members for printing upper or lower case characters respectively.

10. In a wire printing typewriter, means for confining a group of wires at one end thereof in a movable character printing head, means adapted to support printing wires in said head for free, solely-longitudinal movement relative to each other, printing wires supported in said head as aforesaid, said wires having their opposite remote ends arranged in predetermined substantially parallel positions respectively in a wire setting zone, a wire setting device in said zone, comprising code rod means including at least one code rod opposite the remote ends of said wires at said predetermined positions respectively, each said code rod comprising a member having a predetermined arrangement of depressions therein and capable of movement in two directions at substantially right angles to each other and both at substantially right angles to the parallel ends of said wires to bring certain of said depressions into alignment with the remote ends of said wires respectively in accordance with a predetermined code, means for relatively moving said code rod means and said wires in a direction longitudinal of said wires, so as to set certain of said wires in accordance with the character to be printed, a continuously rotating power drive roll for said typewriter, means actuated by said power drive roll for relatively moving said code rod means and the remote ends of said wires as aforesaid, character selecting means, other means controlled by said character selecting means and actuated by said power drive roll for positioning said code rod means in one direction, further means controlled by said character selecting means and actuated by said power drive roll for positioning said code rod means in a second direction at substantially right angles to the first named direction; said character selecting means comprising two groups of movable members, each of which groups consists of a plurality of movable members and each of the members of each said group being movable between two terminal positions respectively, the first of said groups comprising a plurality of members constructed and arranged to control the positioning of said code rod means in one direction and the second of said groups comprising a plurality of movable members constructed and arranged

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to control the positioning of said code rod means in said second direction at substantially right angles to the first named direction as aforesaid, means deriving power from said power drive roll for moving each of said movable members, electrically actuated solenoid means for each of all said movable members respectively for controlling the movement of said movable members by said power roll means, a plurality of character keys for controlling the characters to be printed by said wire printing typewriter respectively and adapted to be selectively manually depressed, and means selectively responsive to the depression of each of said character keys, in accordance with a predetermined code, for energizing electric circuits to actuate said solenoids selectively to cause the actuation of certain of said movable members.

11. A wire printing typewriter in accordance with claim 10, in which there are six of said movable members for positioning said code rod means in accordance with a six-element code, in which there is provided a case shift key, and in which a seventh movable member is provided adapted to be actuated electrically by said case shift key for moving said code rod means so as selectively to bring into wire setting positions one set of wire setting parts for lower case characters and another set of wire setting parts for upper case characters.

12. A wire printing typewriter in accordance with claim 10, in which each solenoid for each of said movable members is connected in a circuit respectively; and in which there is also provided relay means in each circuit for holding the circuit closed once it has been instantaneously closed by respectively associated character keys, and means actuated a predetermined time after the actuation of the code rod positioning means and substantially simultaneous with the initiation of the relative movement between said code rod means and said wires for deactivating all said circuits in preparation for a next operation thereof in positioning said code rod means for the printing of a succeeding character.

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