March 30, 1965 N. A. JACOBS 3,176,068

TYPE WHEEL ACTUATING MECHANISM FOR TELEGRAPHIC PAGE PRINTER

Filed Dec. 14, 1961 2 Sheets-Sheet 1

FIG. 1

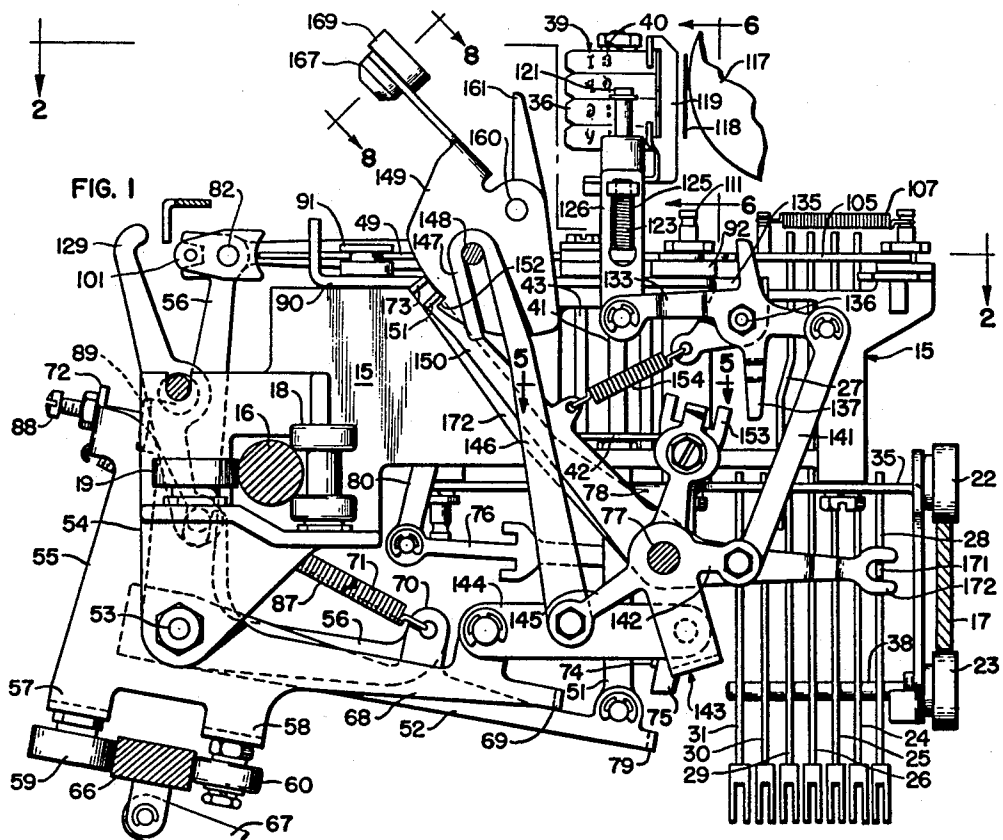
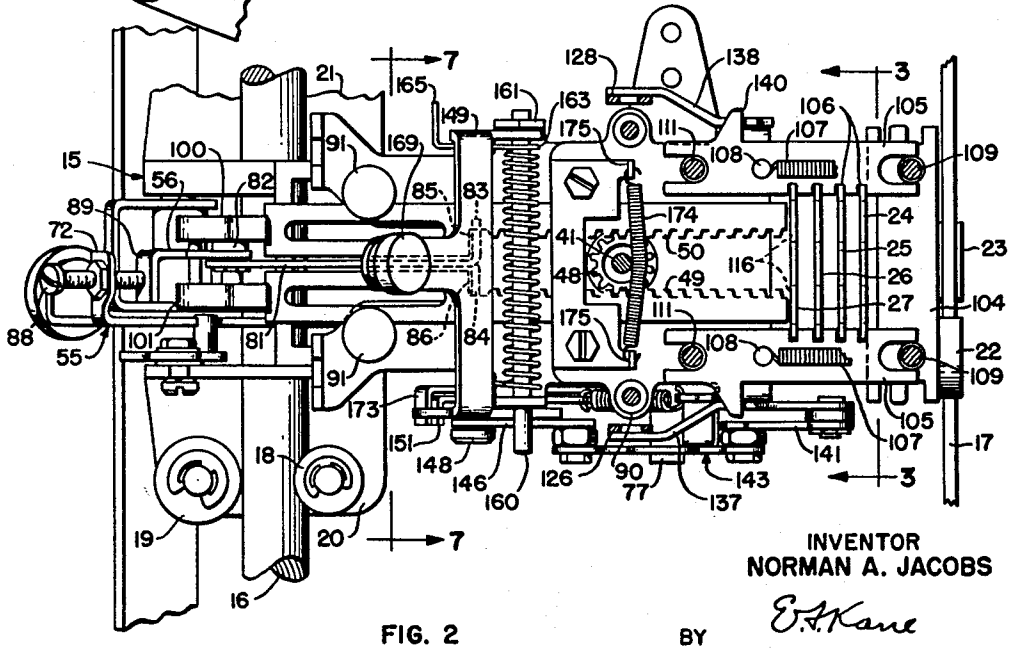


FIG. 2



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TYPE WHEEL ACTUATING MECHANISM FOR TELEGRAPHIC PAGE PRINTER

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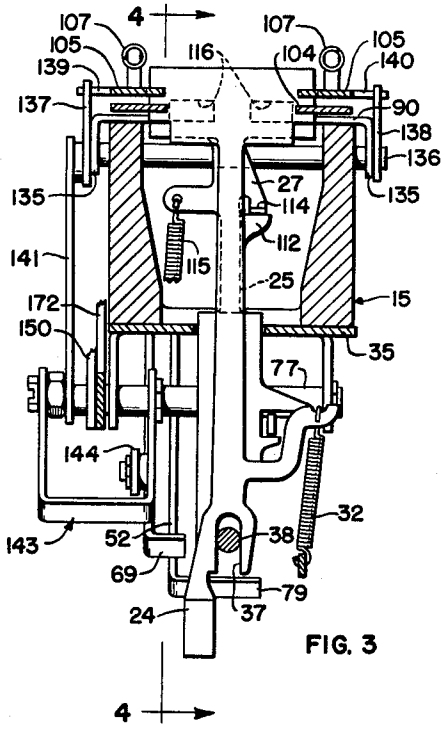

FIG. 3

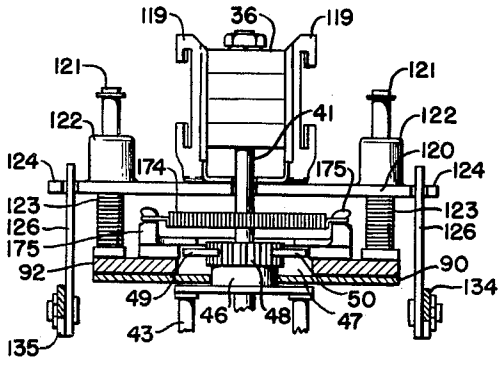

FIG. 6

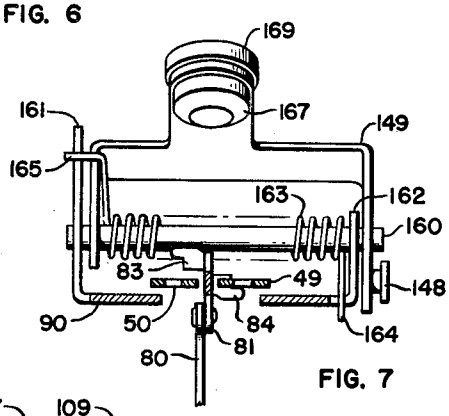

FIG. 7

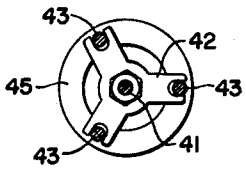

FIG. 5

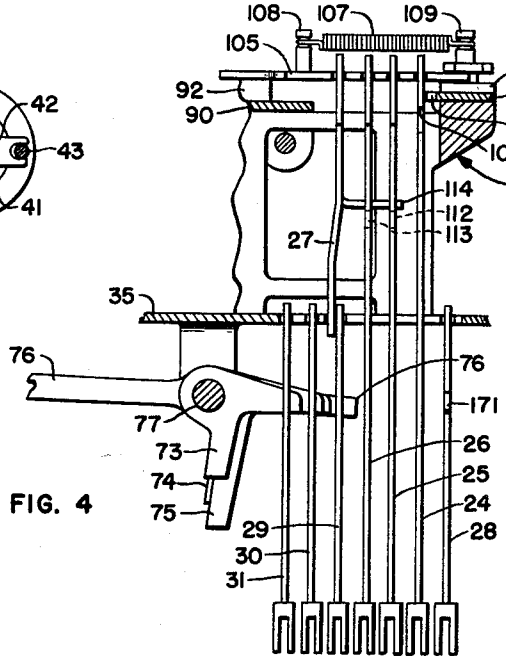

FIG. 4

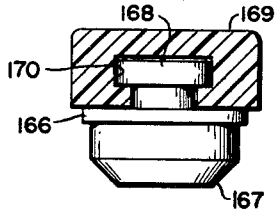

FIG. 8

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TYPE WHEEL ACTUATING MECHANISM FOR TELEGRAPHIC PAGE PRINTER

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Filed Dec. 14, 1961, Ser. No. 159,327
7 Claims. (Cl. 178—28)

This invention relates to a type wheel actuator mechanism and more particularly to a mechanism for driving a type wheel to perform a printing operation after the type wheel has been selectively positioned to select a type on it for use.

The primary object of this invention is to provide a printing mechanism, for use in printing telegraphy, which is of such construction that it may be manufactured at the lowest possible cost consistent with precision and long service.

Another object of the invention is to provide a mechanism, of the simplest possible construction, for driving the type wheel of a type wheel printer into position to effect printing.

Still another object of the invention is to provide simple mechanism for rocking a type wheel to cause the type on it to effect printing after the type wheel has been reciprocated and rotated to select a particular type on its face for the printing of a character.

In accordance with one embodiment of the invention as applied to the type of telegraph printing apparatus wherein a type wheel is selectively reciprocated and rotated, under control of signals received in the apparatus, to select a character on it for printing, a drive mechanism is provided which includes a print hammer assembly including a print bail provided with a hammer arrangement having a soft, resilient face and after the type wheel has been selectively positioned, the print bail is released to snap over to position where the soft resilient face on an extension thereof will strike the type wheel, at a point substantially diametrically opposite the selected type to oscilliate the type into engagement with a ribbon and effect the printing operation. The print bail is restored to an unactuated position and tension is stored in a spring which actuates it toward the end of each cycle of the apparatus, means being provided to latch the print bail in its unactuated position where its actuating spring is under tension and other means being provided for blocking the full operation of the print bail upon the receipt in the apparatus of signals calling for functions other than printing.

A complete understanding of the invention may be had by reference to the following detailed description when considered in conjunction with the accompanying drawings wherein:

FIG. 1 is a partial end elevational view of a printing telegraph page printer, parts being broken away, to show the type wheel actuating means comprising a preferred form of the invention;

FIG. 2 is a view, partly in plan and partly in plan section, taken substantially along the line 2—2 of FIG. 1, in the direction of the arrows, and showing details of the positioning mechanism which positions the type wheel for actuation and also showing some details of the type wheel actuating mechanism;

FIG. 3 is a fragmentary sectional view taken substantially along the line 3—3 of FIG. 2, in the direction of the arrows, showing further details of the print hammer actuating and type wheel positioning mechanisms;

FIG. 4 is a fragmentary sectional view taken substantially along the line 4—4 of FIG. 3, in the direction of the arrows, showing portions of the code responsive elements which serve to control the positioning of the type wheel at the selected rotative positions and elevational levels;

FIG. 5 is a fragmentary sectional view taken substantially along the line 5—5 of FIG. 1 in the direction of the arrows, showing the construction of the type wheel support;

FIG. 6 is a sectional view, taken substantially along line 6—6 of FIG. 1, in the direction of the arrows, showing details of the type wheel positioning mechanism and some portions of a ribbon guiding mechanism;

FIG. 7 is a fragmentary view, taken substantially along the line 7—7 of FIG. 2, in the direction of the arrows, and shows details of construction of the print hammer which strikes the type wheel to effect the printing operation, and

FIG. 8 is a detailed view, on enlarged scale, taken substantially along the line 8—8 of FIG. 1, in the direction of the arrows, showing details of construction of the print hammer.

In the preferred embodiment of the invention, which is illustrated herein, a casting 15 is provided which is movable transversely of the printer mechanism on a guide rod 16 and guide plate 17. The casting 15 has a grooved guide roller 18 and a flat guide roller 19 mounted on an extension 20 of it and a matching pair of grooved and flat guide rollers (not shown) on a second extension 21 of it. These guide rollers 19 and 20 and the pair of guide rollers not shown but mounted on the second extension 21 of the casting 15 co-operate with a pair of flat guide rollers 22 and 23 which ride upon the edges of the guide plate 17 to guide the printing carriage, which includes the casting 15, in its travel across the printer in the same manner as the guide rollers 151 and 152 and 176 and 157 illustrated in the copending application of W. J. Zenner Serial No. 159,330, filed December 14, 1961, the disclosure of which is incorporated herein by reference insofar as may be necessary to understand the structure and operation of the apparatus to be claimed herein.

In the aforementioned application of W. J. Zenner there is described apparatus for permutatively and selectively setting a plurality of slides 164, 165, 166, 167, 182, 183, 184, and 185 for controlling the rotative and reciprocatory motion of a type wheel 86. These slides, described in detail in the aforementioned Zenner application, are the same as the slides 24, 25, 26, 27, 28, 29, 30, and 31, respectively, as illustrated in FIG. 1 of the drawings of this application. Each of the slides 24, 25, 26, 28, 29, 30, and 31 has a spring 32 individual to it for urging it downwardly as illustrated in FIG. 3.

A support plate 35 is fixed to the underside of the casting 15 and has the shafts for the rollers 22 and 23 mounted on it. The sides 24 to 30 for controlling the selection of type on a type wheel 36 in printing operations extend through the support plate 35. Each of the slides 24, 25, 26, 28, 29, 30, and 31 has a slot 37 formed in it adjacent to its lower end (FIG. 3), into which a guide post 38 extends to guide the lower ends of these slides, the upper ends of which are guided in a manner to be described hereinafter. The post 38 is mounted on a vertically extending portion of the support plate 35, as illustrated most clearly in FIG. 1, and the manner in which the slides such as slide 28 are slidably mounted on the post 38 is illustrated most clearly in FIG. 3.

The type wheel 36, as shown in FIG. 1, and as shown and described in detail in the aforementioned application of W. J. Zenner, is cylindrical and has type on its outer face, which type, as indicated by the two rows 39 and 40, are arranged in four levels and the figures and letters characters are in alternate rows. The type wheel 36 is mounted on a shaft 41 which is in turn fixed to a three-armed plate or spider 42 that is slidably mounted on three

posts 43 (FIGS. 1 and 5), forming part of a cage-like structure which includes top and bottom annular plates 44 and 45, respectively. The posts 43 are fixed to the plate 44 and attached to the plate 45. The upper plate 44 is suitably fixed to a bearing ring 46 which is rotatably mounted in a suitable bearing 47 attached to the casting 15 (FIG. 6). An annular gear 48 is fixed to the bearing ring 46 and serves to impart oscillation to the cage-like structure when driven by either one of a pair of racks 49 and 50. The central openings in the annular plates 44 and 45 and in the bearing ring 46 and annular gear 48 are all appreciably larger than the outside diameter of the shaft 41 so that the shaft may be rocked to a limited extent without engaging the upper edge of the opening in the annular gear 48.

The lower end of the shaft 41 is articulated to the upper end of a push rod 51 which has its lower end pivotally connected to an actuator lever 52 that is oscillatably mounted on a pivot post 53. The pivot post 53 is fixed in a pair of downwardly projecting side plates such as the side plate 54 (FIG. 1) formed on casting 15. The pivot post 53 also pivotally supports a main rocker member 55 and a rack driving bell crank lever 56. The main rocker member 55 has formed on it a pair of horizontally extending portions 57 and 58 on which there are rotatably supported a pair of rocker rollers 59 and 60, respectively.

When the casting 15 is moved transversely of the printer, the rollers 59 and 60 will ride along a main oscillating bail 66 which will serve to rock the main rocker member 55 at any position the casting 15 may assume in its travel across the printer. The main oscillating bail 66 is pivoted for oscillation in any suitable manner, such for example as illustrated in the aforementioned application of W. J. Zenner and is oscillated by a main oscillating link 67 in each cycle of the printer. Suitable mechanism for oscillating the main oscillating link 67 may be such as that described in detail in connection with the main oscillating link 251 as disclosed in the aforementioned application of W. J. Zenner.

The main rocker member 55 has a rearwardly extending arm 68 which is bent to form an extension 69 that extends over the actuator lever 52 and will positively rock the actuator lever 52 to the position shown in FIG. 1. The actuator lever 52 has an upwardly extending projection 70 to which there is attached one end of a spring 71. This spring 71 has its other end attached to a transversely extending portion 72 of the main rocker member 55. Thus, the spring 71 will tend to cause the actuator lever 52 to follow the counterclockwise movement (FIG. 1) of the main rocker member 55.

The extent of which the actuator lever 52 is permitted to follow the main rocker member 55, when the main rocker member 55 rocks counterclockwise, as viewed in FIG. 1, may be limited by the ends of three bell crank levers 73, 74, and 75 and consequently the height to which the push rod 51 and the type wheel 36 are moved will be controlled by the lower end of these three bell crank levers 73, 74, and 75. The bell crank levers 73, 74, and 75 are controlled by the slides 30 and 31 in accordance with signals received in the selector mechanism which controls these slides and preferably this selector mechanism is of the type disclosed in the aforementioned application of W. J. Zenner. The slide 28 controls the print suppression function, the slide 24 controls the "shift" or "Figures" function. The slide 29 control the direction in which the type wheel 36 will be rotated and the slides 30 and 31 control the extent to which the type wheel 36 will be elevated.

The bell crank levers 73, 74, 75 and a direction controlling lever 76 are pivoted on a shaft 77 which is carried in a pair of downwardly extending side members such as the side member 78 formed on the plate 35.

The substantially horizontally extending arm of bell crank lever 73 extends into a slot (not shown) in the slide 31. Consequently, when the slide 31 is moved upwardly, the bell crank 73 will be rocked counterclockwise (FIG. 4) from the position shown in the drawing. The bell crank lever 75 has its horizontally extending arm extending into the slot in the slide 31 and into a slot (not shown) in the slide 30. The slots in the slides are of the same configuration as the slots 220 and 221 shown in the copending application of W. J. Zenner and consequently when either the slide 30 or the slide 31 is moved upwardly, the bell crank lever 75 will be rocked counterclockwise (FIG. 4). The bell crank lever 74 extends freely through the slot in slide 31 and into an actuating relation to the slot in slide 30. Consequently, when the slide 30 moves upwardly, the bell cranks 73 and 74 will be rocked counterclockwise (FIG. 4). Thus, if either the slide 30 or 31 or both of them are moved upwardly, the bell crank lever 75 will be rocked counterclockwise out of the path of a laterally extending projection 79 on the actuator lever 52.

If neither of the slides 30 or 31 is moved upwardly the projection 79 on lever 52 will strike the bottom edge of the bell crank 75 to stop the upward movement of the lever 52 and will thereby, through the push rod 51 raise the type wheel 36 to a position where the upper level of it will be in alignment with the printing position. If the slide 31 is moved upwardly and the slide 30 is not moved upwardly, the bell crank levers 73 and 75 will be rocked counterclockwise (FIG. 4) about the shaft 77, but the bell crank lever 74 will not be so rocked and consequently the projection 79 on lever 52 will strike the lower edge of the bell crank lever 74 to stop the type wheel 36 with the second level of type from the top in printing position. If the slide 30 is moved upwardly and the slide 31 is not moved upwardly, the bell crank levers 74 and 75 will be rocked counterclockwise (FIG. 4) about the shaft 77 but the bell crank lever 73 will not be so rocked and the projection 79 will be permitted to move up until it engages the bottom edge of the bell crank lever 73 thereby to raise the type wheel 36 to a position to carry the third level from the top of it into printing position. If both of the slides 30 and 31 are moved upwardly, all three bell crank levers 73, 74, and 75 will be moved to position to carry the lower edges of them out of the path of the projection 79 on lever 52 which will consequently move the type wheel 36 to the uppermost position where the bottom (or fourth) level of it will be in printing position.

As pointed out hereinbefore the slide 29 (FIGS. 1 and 4) controls the direction in which the type wheel 36 will be rotated and when the slide 29 is moved upwardly, it will rock the direction controlling lever 76 about the shaft 77 in a counterclockwise direction (FIGS. 1 and 4). The direction controlling lever 76 has a link 80 (FIGS. 1 and 7) pivotally connected to it and the upper end of the link 80 is pivotally connected to a pull bar 81 that is pivoted on a pivot shaft 82. The pull bar 81 has a pair of driving tabs 83 and 84 formed on its right end (FIG. 2) for selective engagement with shoulders 85 and 86, respectively, on the pair of racks 50 and 49, respectively. When the link 80 and consequently the pull bar 81 is in the position shown in FIG. 7, the tab 84 will be aligned with the shoulder 86 on rack 49. If the slide 29 is moved upwardly, the direction controlling lever 76 will be rocked counterclockwise (FIG. 4) about the shaft 77 and will pull the link 80 and the right end of the pull bar downwardly to align the tab 83 with the shoulder 85 on rack 50.

The shaft 82 (FIG. 1) is mounted at the upper end of the rack driving lever 56 and the rack driving lever 56 is urged to follow the movement of the main rocker member 55 by a contractile spring 87 that is attached to the horizontally extending arm of the lever 56 and to the transversely extending portion 72 of the main rocker member 55. The transversely extending portion 72 of the member 55 has threaded into it an adjustment screw 88 which engages a bent-over portion 89 of the lever 56 to restrict the movement of the lever 56 in a counterclockwise direction (FIG. 1).

The racks 49 and 50 are slidably mounted on the upper surface of a spacer plate 92 mounted on a ribbon support plate 90 which has shouldered buttons 91 fixed to it for supporting and guiding the racks while holding both of them in engagement with the teeth of the annular gear 48. From the foregoing it is believed to be apparent that upon oscillation of the rack driving lever 56 in a counterclockwise direction (FIG. 1) either the rack 49 or the rack 50 will be pulled toward the front of the machine depending upon the position to which the pull bar 81 has been rocked by the link 80 to position either the tab 83 or the tab 84 in operative association with either the shoulder 85 or the shoulder 86, respectively. When one of the racks 49 or 50 is moved toward the front of the printer, the other rack of course, will be forced to move toward the rear of the printer due to the engagement of both racks with the annular gear 48.

The pivot shaft 82 also has mounted on it a pair of rack restoring members 100 and 101 which engage the left ends (FIG. 2) of the racks 50 and 49, respectively, to restore a rack which has been drawn back by the pull bar 81 into the position shown in FIG. 2. These rack restoring members 100 and 101 are loosely pivoted on the shaft 82 and have their rack engaging ends concavely rounded so that they will center themselves properly on a rack which has been pulled forward by the pull bar 81 and as the rack driving lever 56 rocks clockwise (FIG. 1), the rack restoring member 100 or 101 which engages its rack will push the rack to the position shown in FIG. 2. As pointed out hereinbefore the rack driving lever 56 is resiliently urged to move with the main rocker member 55 by the spring 71 and then the rack driving level 56 is moved counterclockwise about the pivot post 53 (FIG. 1) it will resiliently urge one or the other of the racks 49 or 50 to move to the left (FIG. 2) thereby to move the other rack to the right. The rack which is drawn toward the front of the printer by the pull bar 81 will move the other rack toward the rear of the printer until the rearwardly moving rack is stopped by its right end (FIG. 2) contacting one or the other of the slides 27, 26, 25, or 24.

The slides 24, 25, 26, and 27 operate under control of received signals, the slides 24, 25, and 26 being directly actuated and the slide 27 being jointly controlled by the two slides 25 and 26. It will be understood that in the operation of the apparatus the slides 24, 25, 26 28, 29, 30, and 31 are selectively raised under control of received signals at a time in the cycle of operation of the printer prior to the time when the main rocker member 55 is rocked in a counter-clockwise direction (FIG. 1) by the main oscillating bail 66.

As pointed out hereinbefore the direction in which the type wheel 36 is to be rotated is selected under control of the slide 29 operating in conjunction with the pull bar 81. The amount of rotation imparted to the type wheel 36 is controlled by the slides 24, 25, and 26. If the signal received in the selector mechanism of the apparatus is such that a "Figures" character rather than a "Letters" character is to be printed by the type wheel, the slide 24 will be pushed upwardly and in being pushed upwardly will move a shoulder 102 (FIG. 4) on the slide 24 above a lip 103 of a stop plate 104 fixed to the casting 15. Then, when the rack 49 or 50 which has been selected to move toward the right (FIGS. 1, 2, and 4) contacts any one of the slides 27, 26, 25, or 24, it will move a pair of floating guide members 105 a short distance until the right side (FIG. 4) of the slide 24 engages the left face of the lip 103, thus, to rotate the type wheel 36 one increment of rotary movement to present the "Figures" characters to printing position. If, however, the slide 24 is not moved upwardly, but any one of the slides 25, 26, or 27 is moved upwardly, the selected rack 49 or 50 which is moved toward the slides 24 to 27, inclusive, will rotate the type wheel 36 in two-row increments.

All of the slides 24 to 27 are slidably guided in slots 106 formed in adjacent edges of the guide members 105 and the guide members 105 are urged to the right (FIG. 2) by light contractile springs 107 stretched between pins 108 on the members 105 and pins 109 mounted on a plate 110 mounted on top of the stop plate 104 (FIG. 4). Guide pins 111 mounted on the ribbon support plate 90 co-operate with the pins 109 in guiding the guide members 105 for a slight amount of movement when case shifting is performed.

If in the reception of a message by the printer, a signal is received which results in either the slide 25 or the slide 26 being moved upwardly, then the slide 27 will also be moved upwardly since the slides 25 and 26 are provided with shoulders 112 and 113 (FIG. 4), respectively, which are aligned with a horizontally extending arm 114 formed on the slide 27. The slide 27 is urged downwardly to the position shown in FIGS. 3 and 4 by a contractile spring 115 but, as pointed out, will be moved upwardly when either the slide 25 or the slide 26 is raised. When either the slide 25 or the slide 26 is moved upwardly and as a result carries with it the slide 27, the slide 27 will be carried to a position where the end of the rack 49 or 50 which has been selected for movement toward the slides 24 to 27 will pass through an aperture 116 in the slide 27, such as shown in dotted lines in FIG. 3. The slides 25 and 26 also have apertures 116 form in them which may be raised above the level of the tracks 49 and 50 and in the event that both slide 25 and slide 26 are raised and carry with them slide 27, the rack moving toward the slides will move all the way over and engage the slide 24.

From the foregoing it is believed to be apparent that the type wheel 36 may be manipulated to place any one of sixty-four different, discrete areas on it into a printing position. This is effected by selecting any one of the four levels of the type wheel 36 under control of the slides 30 and 31, selecting the direction of rotation of the type wheel under control of the slide 29 thereby to present either one-half or the other half of the wheel 36 to printing position, and by selecting either the "Letters" or "Figures" characters under control of the slide 24 and then selecting from the four rows of "Figures" characters or four rows of "Letters" characters, one discrete row under control of the slides 25 and 26.

After the type wheel 36 is operated to position a specific type on it at the printing position, the type wheel 36, shaft 41, and spider 42 must be rocked to move the type wheel 36 toward a platen 117, (FIG. 1) in order to drive a ribbon 118 against a web of paper on the platen. The ribbon which is of the usual type is fed in the manner described in the aforementioned application of W. J. Zenner from one of a pair of reversible spools of the usual type (not shown) to the other spool upon actuation of a ribbon feed lever 129, driven by the main rocker member 55 as is usual in such printing mechanisms as that presently being described. The ribbon 118 in moving from one to the other of the pair of the spools (not shown) is guided in the path of the type wheel 36 by a pair of ribbon guides 119 (FIGS. 1 and 6) which are mounted on a ribbon guide plate 120.

In order that an operator may read the complete line, which has last been typed on a sheet of paper on the platen 117, the type wheel 36 is moved down by the actuator lever 52 to a point below the last line printed on the paper and since the ribbon 118 would obscure a portion of the message printed on the paper, it too is moved downwardly. In order to accomplish this result the ribbon guide plate 120 is slidably mounted on a pair of posts 121 (FIGS. 1 and 6) that are mounted on the ribbon support plate 90. The ribbon guide plate 120 has bearings 122 formed on it through which the posts 121 extend thereby to insure that the ribbon guide plate 120 will travel in a straight line path when it is reciprocated. The

plate 120 is normally urged upwardly by a pair of springs 123 that encircle the posts 121 and urge the top surface of projections 124 on the ribbon support plate 120 into engagement with the upper end of slots 125 (FIG. 1) formed in a pair of links 126. Upward movement of the ribbon guide plate 120 is limited by snap-on type collars 127 fixed to the posts 121 adjacent to their upper ends thereby to block the movement of the ribbon guide plate 120 upwardly beyond a predetermined point under the influence of springs 123.

The ribbon support plate 90 has a pair of downwardly bent bearing portions 135 (FIG. 3) formed on it for receiving and rotatably suporting an oscillatable shaft 136. The shaft 136 has fixed to its left end (FIG. 3) a trip and restoring lever 137 and has fixed to its right end (FIG. 3) a restoring lever 138. The levers 137 and 138 have upwardly extending arms for engagement with shoulders 139 and 140, respectively, on the floating guide members 105 whereby when the shaft 136 is rocked counterclockwise (FIG. 1) the two floating guide members 105 will be restored to their normal non-operated positions. A horizontally extending arm 133 of the trip and restoring lever 137 (FIGS. 1 and 6) and a corresponding horizontally extending arm 134 (FIG. 6) of the restoring lever 138 are connected to the links 126 whereby when the shaft 136 is rocked in a counterclockwise direction (FIG. 1) the links 126 will be drawn downwardly to the position shown in FIG. 1 thereby to move the ribbon guide plate 120 to its lowermost position as shown in FIGS. 1 and 6.

A second horizontally extending arm of the trip and restoring member 137 has a link 141 pivotally connected to it and to an arm 142 of a bell crank lever 143. The bell crank lever 143 is oscillatably mounted on the shaft 77 and has oscillation imparted to it by a link 144 that interconnects it with the arm 68 of the main rocker member 55. Thus, in each cycle of operation of the printer, the bell crank lever 143 will be rocked clockwise about the shaft 77 (FIG. 1) to oscillate the trip and restoring lever 137 in a clockwise direction to release its upwardly extending arm and the upwardly extending arm of the restoring lever 138 from engagement with the shoulders 139 and 140 on the floating guide members 105 thereby to permit these guide members 105 to be moved to the right as viewed in FIGS. 1 and 2, provided one of the floating guides 105 is not blocked by the movement of the slide 24. In rocking or oscillating in a clockwise direction (FIG. 1) the leftwardly extending horizontal arm of the lever 137 (FIG. 1) will permit the springs 123 to move the ribbon guide plate 120 upwardly thus to carry the ribbon 118 up into position to co-operate with the platen 117 and type wheel 36.

The bell crank lever 143 has a diagonally extending arm 145 formed on it, on which there is pivoted a print bail actuating link 146, the upper end of which is provided with a hook portion 147 that engages a pin 148 mounted on one of the side plates of a print bail 149. When the bell crank lever 143 is oscillated or rocked in a counterclockwise direction (FIG. 1) it will draw the link 146 downwardly to the position shown, thereby to rock the print bail 149 to the position shown. When, in the cycle of operation of the printer, the main rocker member 155 is rocked in a clockwise direction (FIG. 1), the print bail actuating link 146 will move upwardly to release its control over the print bail 149. However, at this particular time, the print bail 149 will be held in the position shown, by a print bail latch 150 which has a latching portion 151 in engagement with a latching shoulder 152 formed on the side plate of the print bail 149. As the bell crank lever 143 continues to be rocked in a clockwise direction (FIG. 1), through the action of the link 144 and the main rocker member 55, the downwardly extending arm of the trip and restoring lever 137, in being rocked counterclockwise, will engage an adjustable abutment 153 on the print bail latch 150 to rock the latch 150 about the shaft 177. The print bail latch 150 is normally urged to rock clockwise (FIG. 1) by a contractile spring 154 which has one end connected to the print bail latch 150 and the other end connected to the bearing portion 135 of the ribbon support plate 90. The downwardly extending arm of the trip and restoring lever 137 will, as it continues to rock clockwise (FIG. 1) trip the print bail latching portion 151 out of abutting relation with the latching shoulder 152 to release the print bail 149.

The print bail 149 is oscillatably mounted on a shaft 160 which is in turn supported in a pair of upwardly extending side plates 161 and 162 of the ribbon supporting plate 90 (FIG. 7). A coil spring 163 encircles the shaft 160 and has its right end 164 (FIG. 7) extending downwardly to engage a portion of the side plate 161 and has its left end 165 bent at right angles so that the end 165 of the spring 163 bears against the left side (FIG. 7) of the print bail 149 to urge the print bail 149 to rock in a clockwise direction as viewed in FIG. 1. The end portion of the left end 165 of the spring 163 is limited in its movement by the side plate 161 which extends upwardly to a position to be engaged by the left end 165 whereby if the print bail 149 is released by the latching portion 151 it will be snapped in a clockwise direction (FIG. 1) by the spring 163 and will continue to move of its own momentum as the end 165 of the spring 163 strikes the upwardly extending portion of the side plate 161.

The print bail 149 has an extension 166 formed on it at the upper end of which there is mounted a stud 167. The stud 167 has a cylindrical shoulder 168 formed on it as seen most clearly in FIG. 8, onto which there may be attached, by a snap fit, a soft rubber cap 169. This cap may be of rubber or any other suitable resilient material and is provided with an undercut portion 170 for registration with the cylindrical shoulder 168 on the stud 167 whereby the cap 169 may readily be replaced.

Upon the receipt in the apparatus of a signal calling for the operation of a "function" such for example as a line feeding function, a case shift function, a space function or other similar machine functions which do not entail printing, the slide 28 will not be moved upwardly. This slide 28 is moved upwardly each time a character is to be printed and, as just stated, is not moved upwardly upon receipt in the apparatus of signals calling for functions which do not involve printing. As may be seen more clearly by reference to FIG. 1 the slide 28 has a projection 171 on it which enters into the bifurcated end of a print suppress bell crank 172. This print suppress bell crank 172 is pivoted on the shaft 77 and has a latching portion 173 which extends into the path of the latching shoulder 152 on the print bail 149. Consequently, when a signal representing a function other than printing is received in the apparatus the print suppress bell crank 172 will not be rocked counterclockwise (FIG. 1) about the shaft 77 and its latching portion 173 will remain in the path of the shoulder 152 to prevent the print bail 149 from rocking far enough in a clockwise direction to strike the type wheel 36. On each cycle of the apparatus where printing is to be effected the print suppress bail crank 172 will be moved out of the path of the latching shoulder 152 prior to the time the latching portion 151 of the print bail latch 150 is rocked out of engagement with the shoulder 152. Thus, the spring 163 will be permitted to drive the print bail 149 over to cause the cap 169 on the extension 166 to strike the type wheel 36 at a point diametrically opposite to the character which has been selected for printing and consequently, the type wheel 36 will be driven against the ribbon 118 to cause the printing of the selected character on a sheet of paper on the platen 117. The printing will be done on the over-throw of the print hammer assembly including the print bail 149 and the extension 166 and the shaft 41 and plate or spider 42 will be rocked

with respect to the posts 43. In order to insure that the shaft 41 on which the type wheel 36 is mounted is restored to a position where it will not touch the ribbon 118, a light coiled spring 174 is stretched between the pair of projections 175 and bears lightly against the shaft 41 thus to insure the restoration of the type wheel 36 to substantially vertical position. This spring 174 is not strong enough to materially resist the overthrow of the print bail 149 under the action of the spring 163.

Although a particular embodiment of the invention is shown in the drawings and described in the foregoing specification, it will be understood that the invention is not limited to that specific embodiment, but is capable of modification and rearrangement, and substitution of parts and elements without departing from the scope of the invention.

What is claimed is:

1. The combination with a reciprocatable and rotatable type wheel of a three-point support for the type wheel for controlling the rotary position thereof and for guiding it in its reciprocatory motion, and a hammer for striking the type wheel to oscillate it with respect to its three-point support into a printing position whereby the type wheel after being reciprocated to a selected position and rotated to a selected position may be struck to oscillate it and effect printing.

2. The combination with a type wheel that is reciprocatable and rotatable to select a type on its periphery for printing and oscillatable to effect printing, of an actuating mechanism to oscillate the type wheel comprising a print bail, spring means for actuating said bail, a releasable latch for holding said bail in an unactuated position to hold said spring means under tension, a soft faced print hammer on said bail, means pivotally supporting said bail for oscillation in a path where the face of the hammer on it will strike the type wheel at a point diametrically opposite to the selected type to drive said type to a position to effect printing when said latch is released, and means for releasing said latch after the type wheel has been positioned to select a type on its periphery for printing.

3. The combination with a type wheel that is reciprocatable and rotatable to select a type on its periphery for printing and oscillatable to effect printing, of an actuating mechanism to oscillate the type wheel comprising a print bail, spring means for actuating said bail, a releasable latch for holding said bail in an unactuated postition to hold said spring means under tension, a soft faced print hammer on said bail, means pivotally supporting said bail for oscillation in a path where the hammer on it will strike the type wheel at a point diametrically opposite to the selected type to drive said type to a position to effect printing when said latch is released, means for releasing said latch after the type wheel has been positioned to select a type on its periphery for printing, and print suppression means selectively operable to block operation of said bail when it is released by said latch.

4. The combination with a type wheel that is reciprocatable and rotatable to select a type on its periphery for printing and oscillatable to effect printing, an actuating mechanism to oscillate the type wheel comprising a print bail, spring means for actuating said bail, releasable latch for holding said bail in an unactuated position to hold said spring means under tension, a lever extension on said bail, a soft faced print hammer on the end of said extension, means pivotally supporting said bail for oscillation in a path to move said extension through an arc to impinge the face of the hammer on the type wheel at a point diametrically opposite to the selected type to drive said type to a position to effect printing when said latch is released, and means for releasing said latch after the type wheel has been positioned to select a type on its periphery for printing.

5. The combination with a type wheel that is settable under control of permutatively actuated mechanisms to select a type on it for printing and which may be oscillated after it has been set, of a print hammer movable through an arcuate path to strike the face of the type wheel at a point diametrically opposite to the selected type to oscillate the type wheel to drive the selected type to a printing position, means operable after the type wheel has been set to its selected position for releasing said print hammer for movement through its arc, and means operable thereafter for restoring the print hammer to an unoperated position preparatory to performing a succeeding printing operation.

6. The combination with a type wheel that is settable under control of permutatively actuated mechanisms to select a type on it for printing and which may be oscillated after it has been set, of a print hammer movable through an arcuate path to strike the face of the type wheel at a point diametrically opposite to the selected type to drive the selected type to a printing position, spring means for actuating said print hammer, means operable after the type wheel has been set to its selected position for releasing said print hammer for movement through its arc by said spring means, means in the path of said spring means for disengaging it from the print hammer just prior to impingement of the hammer with the type wheel whereby the momentum of the print hammer will carry it into engagement with the type wheel, and means operable thereafter for restoring the print hammer to an unoperated position preparatory to performing a succeeding printing operation.

7. The combination with a type wheel that is settable under control of permutatively actuated mechanisms to select a type on it for printing and which may be oscillated after it has been set, of a print hammer bail movable through an arcuate path to drive the selected type to a printing position, an extension on said bail, a shouldered stud mounted adjacent to the free end of said extension, a soft resilient cap mounted on said stud and held thereon by resiliently engaging the face and shoulders of the stud and constituting a hammer face for striking the face of the type wheel diametrically opposite to the selected type means operable after the type wheel has been set to its selected position for releasing said print hammer bail for movement through its arc to drive the resilient cap against the type wheel, and means operable thereafter for restoring the print hammer bail to an unoperated position preparatory to performing a succeeding printing operation.

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