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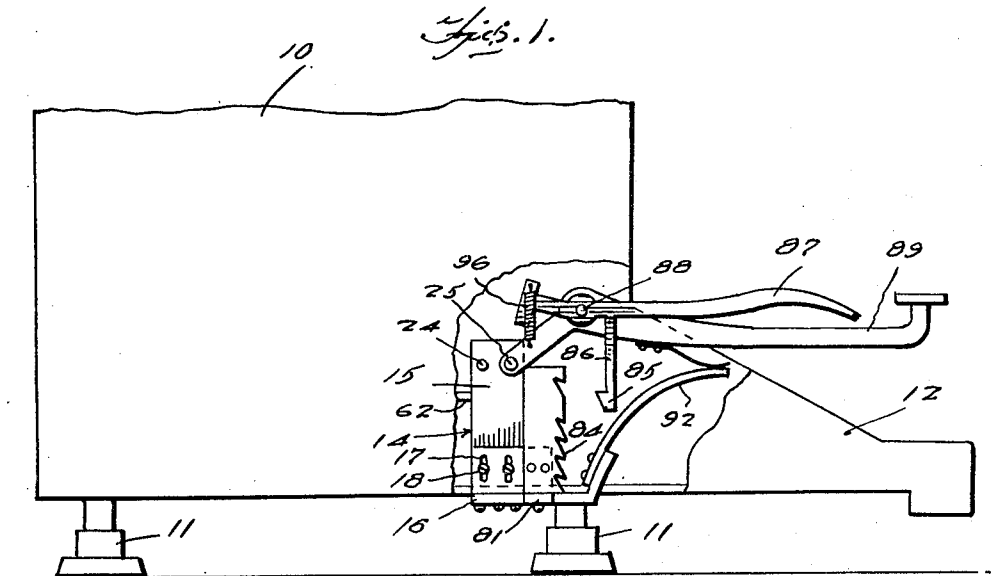
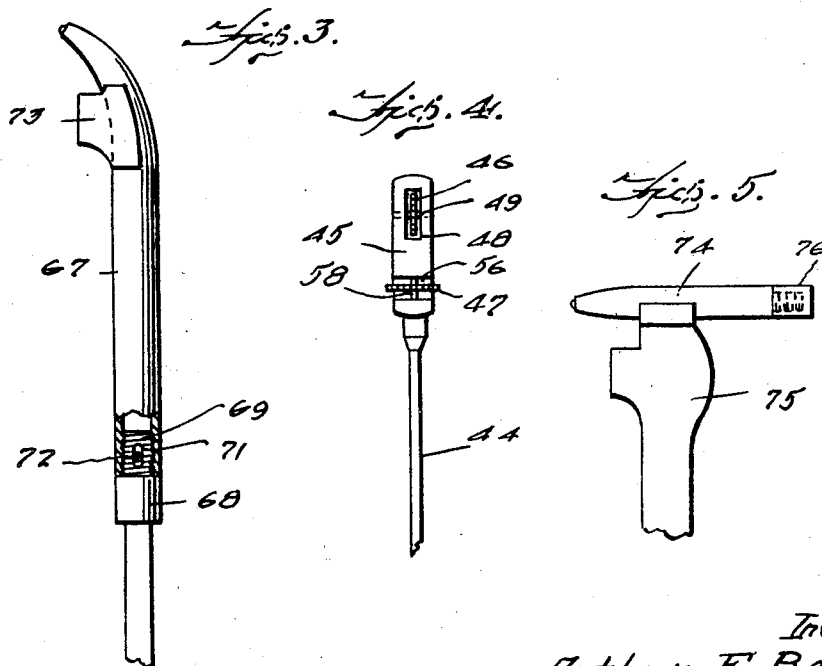
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LINE-FORMING ATTACHMENT FOR TYPEWRITERS

Filed May 27, 1947

2 Sheets-Sheet 1



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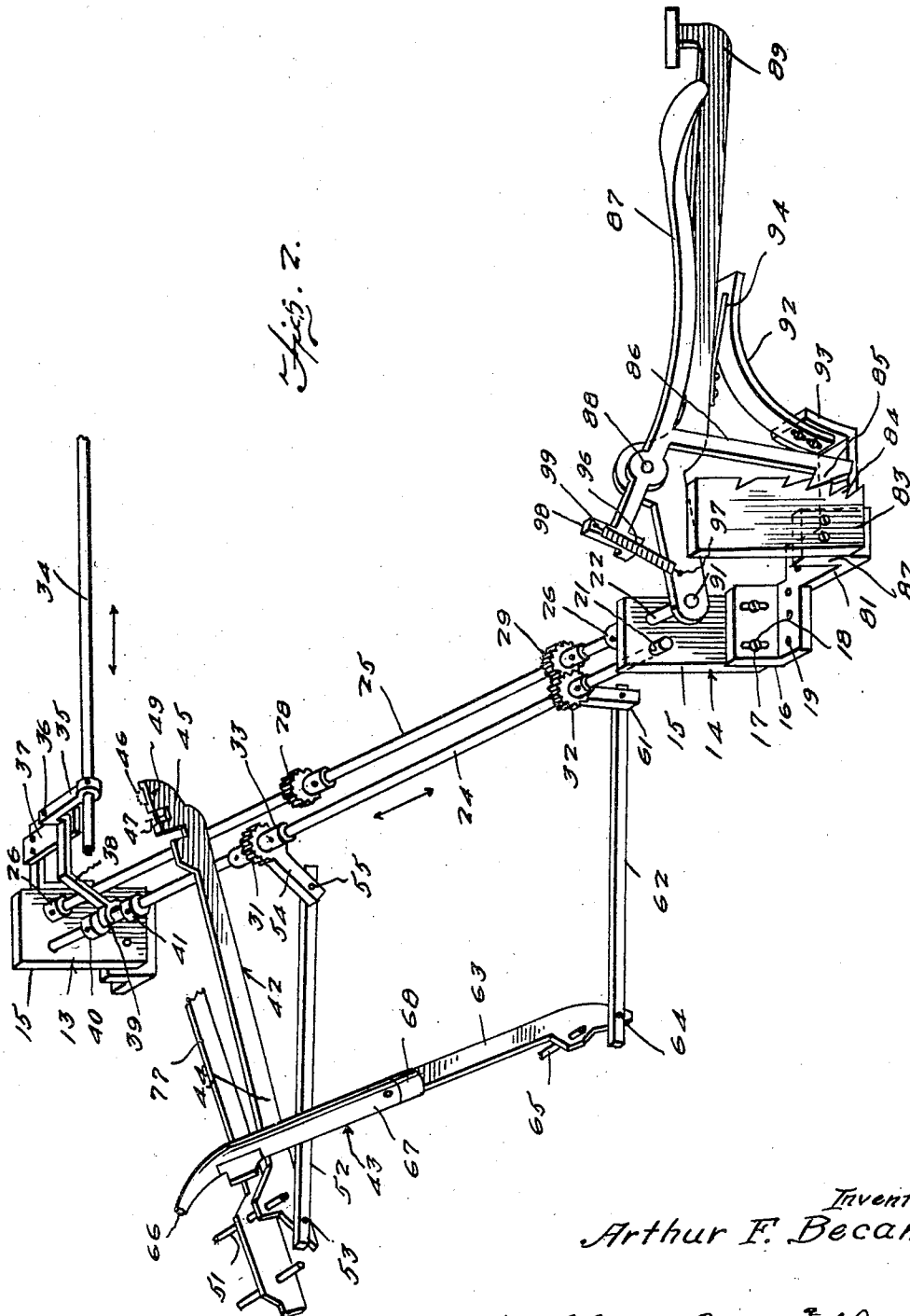
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LINE-FORMING ATTACHMENT
FOR TYPEWRITERS

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This invention relates to typewriters, and more particularly to attachments adapted for use with typewriters, whereby vertical and horizontal lines can be disposed upon the paper within the typewriter.

It is an object of the present invention to provide attachments for typewriters which will make vertical and horizontal lines quickly and easily upon the paper within the typewriter, and which have particular use for the forming of lone lines on the sheet without the continual striking operation which is necessary in effecting such long lines with the present underline key of the typewriter.

It is another object of the present invention to provide an attachment for typewriters which will form dotted lines extending both vertically and horizontally.

To effect these objects, additional type arms are added to the typewriter, or business machine, in available space upon the machine depending upon the model of the machine, such space being readily found at the side of the last type arm at either the right or left side of the typewriter. These arms are attached to be pivoted from the same part of the machine in the same manner that the type key arms are pivoted. In lieu of type on the arm there is provided a modified miniature version of a ball point pen adapted to have replaceable cartridges for supplying the ink material to the ball and to form continuous vertical and horizontal lines when the arm and the ball point are brought into engagement with the sheet within the machine. Another arm carries two small toothed wheels, or styli, one to revolve on a horizontally extending axis to provide a vertical dotted line, and the other to revolve on a vertical axis to provide a horizontal dotted line. These dotted lines are used in stencil work, and are formed by the actual cutting or punching of the paper. A line key is provided with the necessary mechanism to cause the ball point pen to be pivoted from its normal resting position and firmly pressed against the sheet within the typewriter. Mere horizontal movement of the carriage of the typewriter quickly and easily causes the desired horizontal line to be drawn upon the sheet and the rotating of the platen quickly produces a vertical line. The typewriter ribbon will remain in lowered position at times when the ball point pen and toothed wheel are being used since the use of the new type arms will not effect a simultaneous raising of the ribbon for employment as is done by a coordinated action in the use of the standard type arms. A release key is dis-

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posed adjacent the line key which effects a release of the arm and return of the arm to its normal or inoperative position.

Connections are made with the standard ribbon bar to effect automatically the drive coupling connection of the toothed wheel arm with the operating key or the ball point pen arm with the operating key at the same time that the standard ribbon lever is set for either stencil or normal typing positions. With the standard ribbon lever set in stencil position, depression of the new line key operates the toothed wheel styli arm to be employed for stencil work while with the standard ribbon lever set for normal typing, depression of the new line key operates the ball point pen arm to be employed. In use of the toothed wheel arm, the standard shift lock key will be depressed, as in normal typing procedure, to cause the upper character or vertical wheel to be engaged in the event it is desired to cut a vertical dotted line.

For other objects, and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a side elevational view of a portion of a typewriter with a portion broken away to show the application thereto of lining means illustrative of the invention.

Figure 2 is a perspective view of an improved lining means adapted to be operatively associated with a typewriter.

Figure 3 is a detail elevational view of a ball point pen constituting an element of the improved lining means.

Figure 4 is a fragmentary elevational view of a toothed wheel arm constituting another element of the improved lining device.

Figure 5 is a side elevational view of a modified form of ball point pen.

Referring now particularly to the figures, 10 represents a typewriter having a frame supported upon the usual feet 11 and provided with a forwardly extending keyboard 12, a conventional carriage, not illustrated, movable transversely of the frame and a rotatable platen carried by the carriage. Connected to opposite sides of the typewriter and extending upwardly are brackets 13 and 14. Each of these brackets is made in two parts, one part being shown at 15 and the other part at 16. The part 15 can be adjusted relative to the part 16 by the provision of slots 17 in the part 16 and clamping bolts 18 extending through the slots and adapted to be secured at any station along the height of the slots. Bolt

holes 19 are provided in the part 16 for the attachment of the brackets to the typewriter frame 10. At the upper end of the bracket part 15 are openings 21 and 22 through which can be extended shafts 24 and 25. These shafts extend transversely across the full width of the typewriter. The shaft 24 can be longitudinally and rotationally adjusted through the openings 21 of the bracket parts 15. The shaft 25, however, is fixed against axial displacement by collars 26 abutting the faces of the bracket parts 15.

To the shaft 25 there are affixed axially spaced pinion gears 28 and 29. On the shaft 24 there are connected axially spaced pinion gears 31 and 32, adapted to be respectively brought into mesh with the gears 28 and 29 of the shaft 25. Since the shaft 24 is axially adjustable, the gears likewise will be adjustable, and either the gear 32 will be placed in mesh with the gear 29, or the gear 31 will be placed in mesh with the gear 28. The gear 31, however, rotates upon the collar 33, so that when the gear 31 is in mesh with the gear 28, the gear 31 will be rotated without effecting the rotation of the shaft 24. The gear 32 may be similarly connected to its collar, but this is not necessary.

At the right side of the machine is the standard ribbon bar 34 on common machines, forward and rearward movement of which is controlled by setting the standard ribbon lever of the machine in either stencil or typing positions. Placing the standard ribbon lever in stencil position causes a forward movement or shift of the bar, and arm 35 is pivoted forwardly about a pivot point 36 on a bracket 37 extending from the bracket part 15. Coupled to the arm 35 is an arm 38 having a forked formation 39 at its outer end adapted to extend over the shaft 24 to engage collars 40 and 41 thereon. With the bar 34 moved forwardly or to the right as viewed in Figure 2, the forked formation 39 will abut the collar 41 and cause the shaft 24 to be moved to the left and to take with it the gear 31 and place the same in mesh with the gear 28, and at the same time unmesh the gear 32 from the gear 29. This will make possible the use of a dotted line device 42, whereas in the position as shown and before the gear 31 had been shifted the arrangement was such as to effect the operation of a ball point pen device 43.

The dotted line device 42 comprises an arm 44 having a head formation 45 at its upper end adapted to contain two toothed wheels 46 and 47. The wheel 46 is disposed within a slot 48 in the upper end of the head formation 45 and in such a manner that the wheel may rotate about a horizontal shaft 49 extending between the sides of the slot or opening 48. This wheel 46 will be used at times when it is desired to place a dotted line upon the sheet in the typewriter which extends in a vertical direction. With the arm 44 brought into a position to effect this result, the same can be done quickly by simply rotating the platen containing the paper sheet. The arm 41 is pivoted upon a pin 51 carried upon some part of the typewriter, such as the typewriter part upon which the conventional type bars are pivoted. Below this pivot a link 52 is pivotally connected to arm 44 at 53, which will serve to pivot the arm upwardly on its pivot pin 51, this link connecting at 55 to an arm 54 extending from the gear 31. When the gear 31 is in mesh with the gear 28 and the shaft 25 is rotated, the gear 31 will be rotated and the arm 54 thereof will be brought downwardly

to cause the arm 44 to be brought upwardly and into engagement with the sheet within the typewriter.

The wheel 46 and the wheel 47 may be selectively positioned for operative contact with a paper sheet or stencil in the typewriter by operation of the conventional type bar shift lever 77 which is effective to relatively move the typewriter platen and the pivotal support for the type bars to bring different parts of the type bar striking ends against platen carried paper.

The wheel 47 is carried upon a shaft 58 extending vertically through the notch 56. At times when it is desired to have a dotted horizontal line, the arm 44 will be brought upwardly and the carriage of the typewriter will be slid across the typewriter frame, whereupon the wheel 47 will be operated and dotted impressions will be made upon the sheet.

On the pinion 32 is an arm 61 connected by a link 62 to the ball point arm 63 forming a part of the ball point device 43. This link is connected to this arm, as indicated at 64, and the arm in turn is pivoted upon a shaft 65. When the gear 32 is in mesh with the gear 29, as shown, and the shaft 25 is rotated, the ball point 66 will engage the sheet in the typewriter.

The ball point pen device 43 includes a cartridge formation 67 adapted to be removably attached to a head 68 on the arm 63 and upon a threaded projection 69 provided for the purpose. The cartridge 67 is screwed down upon the threaded projection 69 and is retained thereon against turning movement by a cotter pin 71 extending through a slot 72 in the threaded projection 69 and through holes in the cartridge sleeve 67. The upper end of the cartridge has a guide arm 73 securely attached thereto to guide the ball point device over the typewriter platen.

Referring now particularly to Figure 5, there is shown a modified form of the ball point cartridge wherein the cartridge, as indicated at 74, is retained in a horizontal position upon the top end of a specially formed arm 75. The screw cap 76 provides access for replenishment of ink supply in cartridge form.

Coming now to the device for effecting the rotation of the shaft 25, there is provided a lateral extension 81 on the bracket part 16 at the left side of the typewriter. The outer end of the projection 81 is bent upwardly, as indicated at 82, and carries a notched vertically extending plate 83. This plate may be adjustably secured to the extending formation 82, if desired. This plate 83 has a plurality of notches 84 adapted to be engaged by a projection 85 on a depending arm 86 of the line key 87. The line key is pivotally mounted on the release key 89 by a pivot pin 88 above the point where the teeth or notches 84 are engaged by the projection 85. As the key 89 is brought down by the key 27 against a stop 92, which may be adjustably connected to a formation 93 upon the projection 81, the shaft 25 to which the key 89 is secured at 91 will be rotated. The key 89 in its engagement with the stop 92 will be cushioned by a spring 94 which will aid the return of the key 89 to its normal position raised above the stop 92. As the shaft 25 is rotated by keys 87 and 89, the respective devices 42 and 43, depending upon which one has been selected, will be brought to bear against the sheet of paper in the typewriter carriage.

In order that the keys 87 and 89 may be held down without the requirement of manual labor, the arm 86 is arranged so that its detent for-

mation 85 will engage one of the notches 84. After the line has been formed, the release arm 89 can be slightly depressed so as to release tension at the point of engagement of detent 85 with the notch 84 and permit a tension spring 96 to return the line key arm 87 to a position wherein the detent 85 will be out of engagement with the notch 84. The spring 96 is connected, as at 97, to the rear end of the key arm 89 and is connected at its opposite end, as indicated at 98, to a formation 99 on the rear end of the line key 87.

It should now be apparent that there has been provided an attachment for a typewriter whereby vertical and horizontal lines can be formed upon the sheet within the typewriter carriage with ease and in an expeditious manner. It should also be apparent that the attachment has made use of the standard ribbon release arm or ribbon bar to effect the selection of one or the other of its devices.

Having now described my invention, what I claim is:

1. In combination with a typewriter having a frame, a keyboard, and ribbon shift means operative to position a ribbon for stenciling or for normal typing, means operatively associated with said typewriter to provide vertical or horizontal full or dotted lines on paper or a stencil carried by said typewriter comprising a pair of arms pivotally mounted on a fixed portion of said typewriter one at each side of said frame, a pen device carried at the outer end of one arm, a pair of relatively perpendicular toothed wheels carried at the outer end of the other arm, a pair of adjustable brackets secured to said frame one at each side of said keyboard, a pair of parallel shafts rotatably mounted in said brackets, means restraining one of said shafts against lengthwise movement relative to said brackets, two pairs of mutually engageable gears on said shafts with one gear of each pair on each shaft and relatively spaced so that only one pair can be in mutual engagement at a time, means operatively connecting said ribbon shift means with the other of said shafts to selectively engage one pair or the other of said gears by imparting lengthwise movement to said other shaft, means operatively connecting one of said arms to one pair of gears and the other arm to the other pair of gears, a release key extending from said one shaft, a line key pivotally secured to said release key and operative upon depression thereof to rotate said one shaft and thereby move one or the other of said arms into operative position, and means carried by said line key and engageable with the adjacent one of said brackets to hold the keys in depressed position, said holding means being releasable by depression of said release key.

2. In combination with a typewriter having a frame, a keyboard, and a shifting mechanism operative to position the typewriter type bars relative to the typewriter platen in upper case and lower case printing positions, means operative to apply vertical and horizontal lines to paper held in said typewriter comprising a pair of arms each pivoted at one end to the type bar

supporting component of the typewriter, a single marking device at the free end of one arm, a pair of selectively usable marking devices at the free end of the other arm, a key pivotally mounted on said typewriter, means connecting said key and said arms to selectively operate said arms to bring the corresponding marking devices into contact with the paper, means operatively connecting said ribbon shift mechanism with said key and arm connecting means to control the selection of said arms, and means operatively connecting said shifting mechanism and said other arm to control the selection of said pair of selectively usable marking devices.

3. A line-forming attachment for a typewriter comprising an arm with line-forming elements on the upper end of the same, said arm pivotally connected to the typewriter frame, the typewriter having a ribbon shift bar for moving the ribbon to a stencilling position, mechanism for operating the line-forming arm to position the same into operative engagement with paper within the typewriter and including a key adjacent the keyboard of the typewriter and adapted to be depressed, and mechanism extending between the ribbon shift bar and the arm-operating mechanism to automatically condition the arm-operating mechanism upon movement of the ribbon shift bar for use to effect the upward swinging of the arm.

4. A combined continuous line and dotted line attachment for typewriters comprising upstanding brackets attached to the opposite sides of the typewriter frame, parallel shafts extending between the brackets, one of said shafts adapted to be adjusted axially through the brackets while the other shaft is retained for rotation only, a key-operated lever connected with the rotatable shaft to rotate or turn same, said key extending to a location adjacent the keyboard of the typewriter, fixed gears on the rotating shaft axially spaced from each other, fixed gears on the axially movable shaft axially spaced from each other and adapted to be placed in mesh one at a time with the corresponding gears on the rotating shaft, linkage connecting the standard ribbon shift bar with the axially movable shaft to adjust the same, a dotted line forming device connected to one of the gears on the axially movable shaft to move the dotted line forming device into position to effect the forming of a dotted line on the paper within the typewriter, and a pen arm for disposing a full line upon the paper connected for actuation with the other of said gears on the axially movable shaft.

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