May 2, 1939. W. F. HELMOND 2,156,475

TYPEWRITING MACHINE

Filed Feb. 20, 1937 4 Sheets-Sheet 1

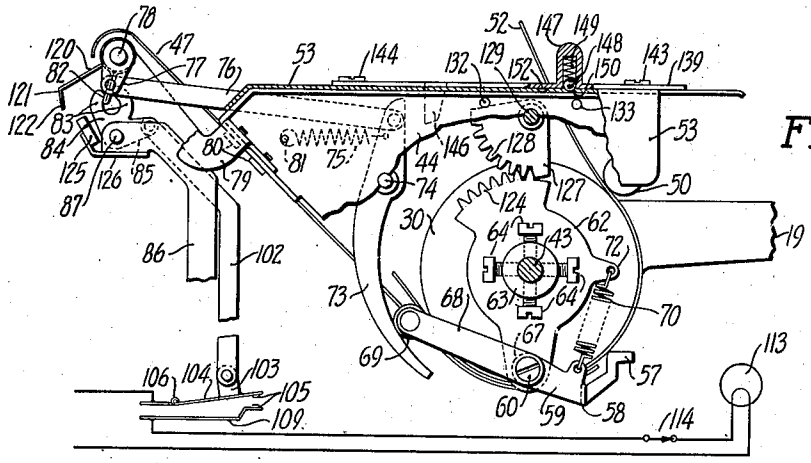


Fig. 1.

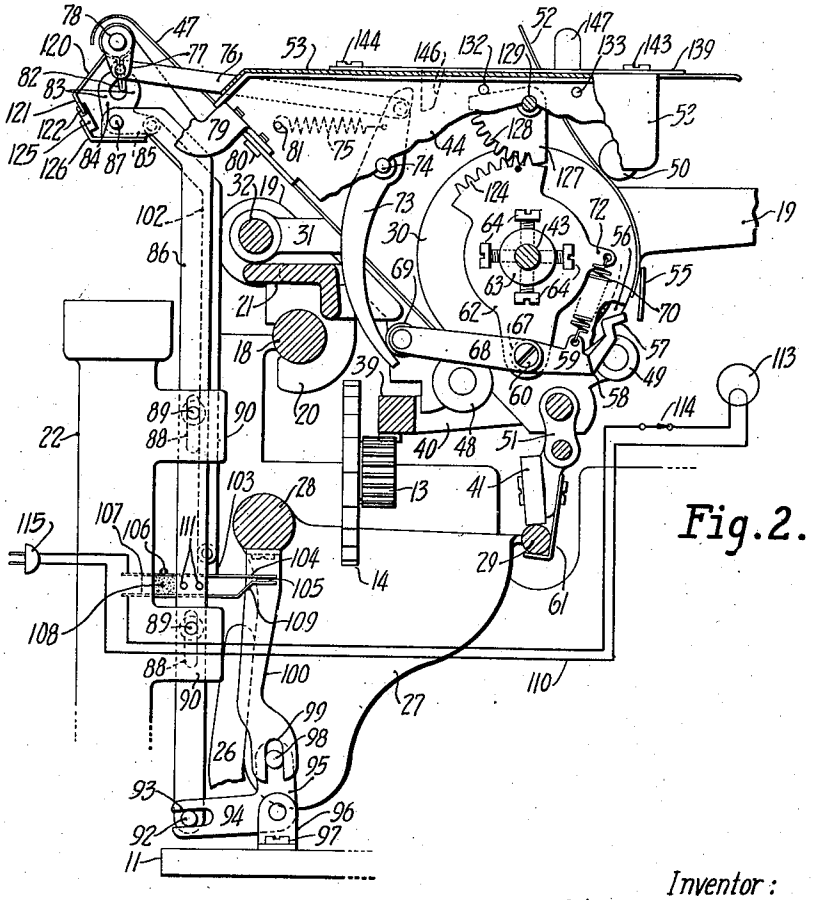


Fig. 2.

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TYPEWRITING MACHINE

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Fig. 3.

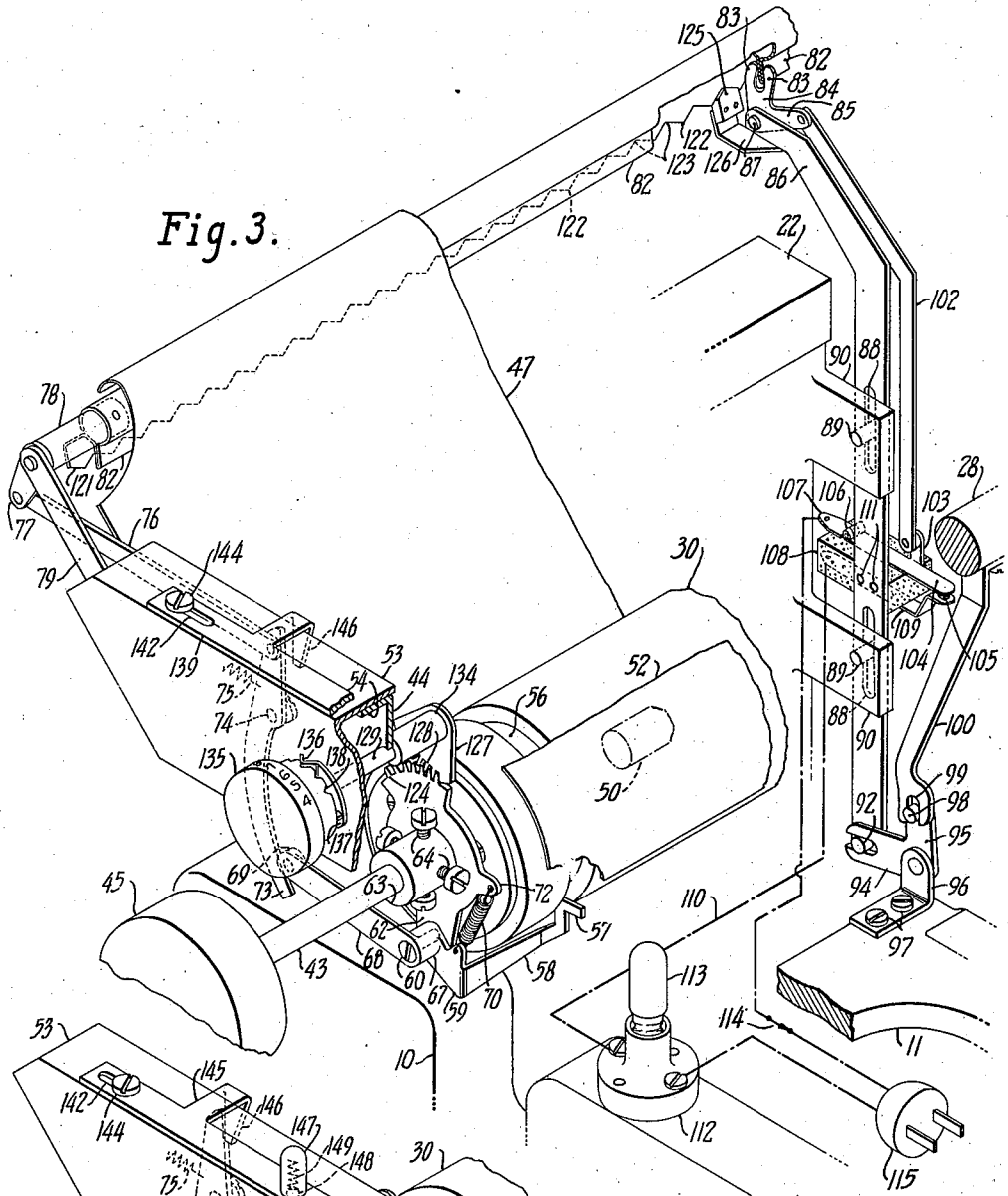
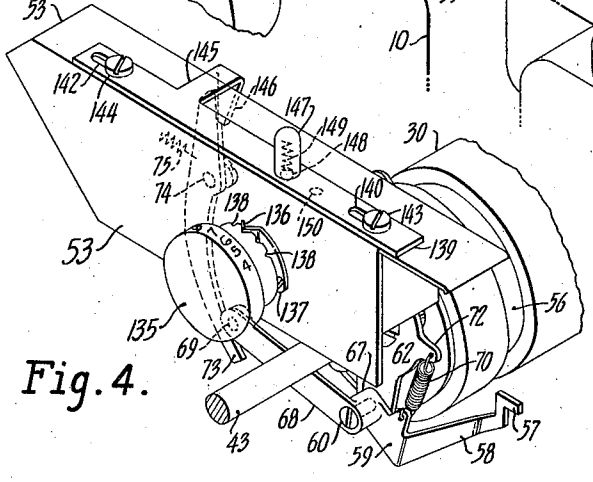


Fig. 4.



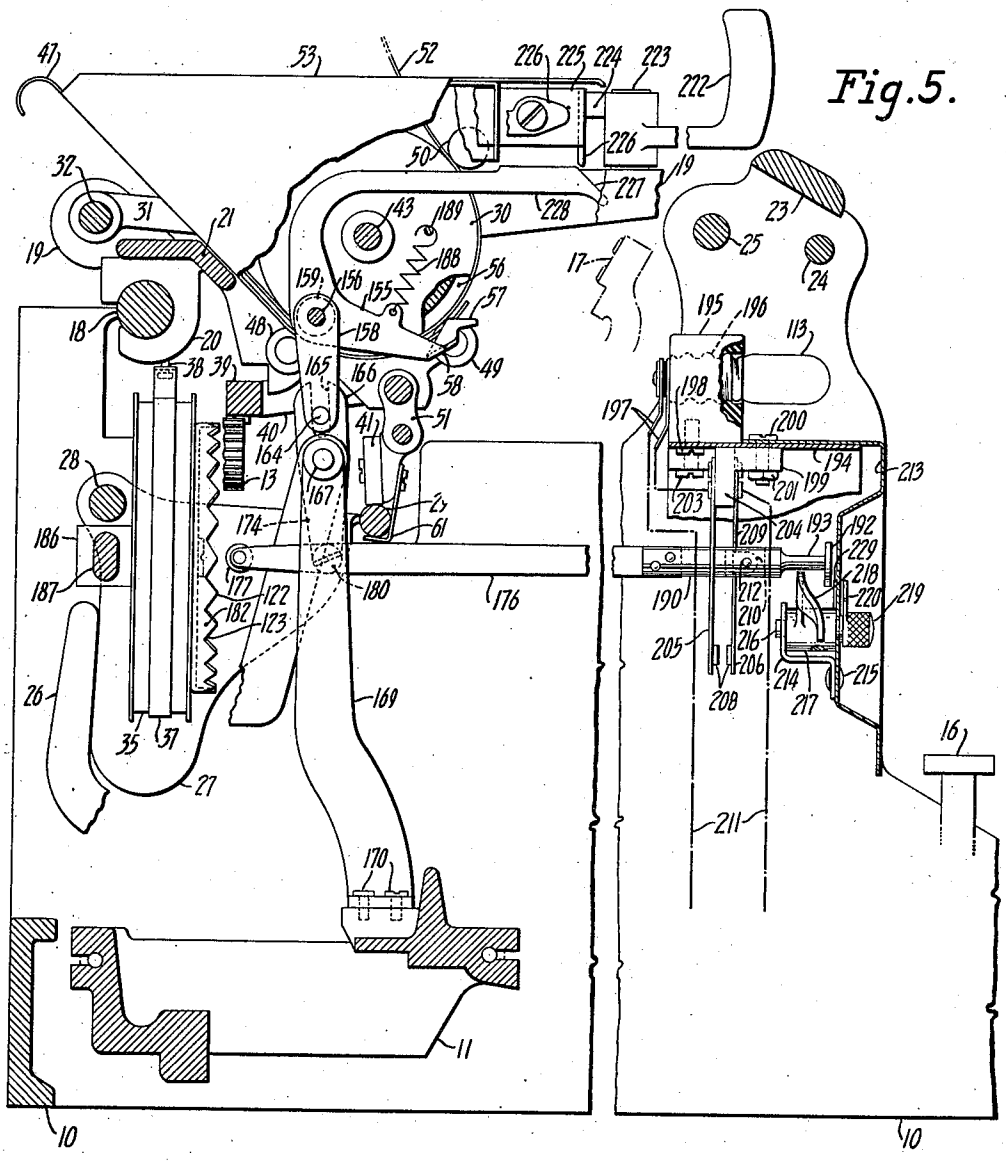
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TYPEWRITING MACHINE

Filed Feb. 20, 1937 4 Sheets-Sheet 3

Fig.5.



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TYPEWRITING MACHINE

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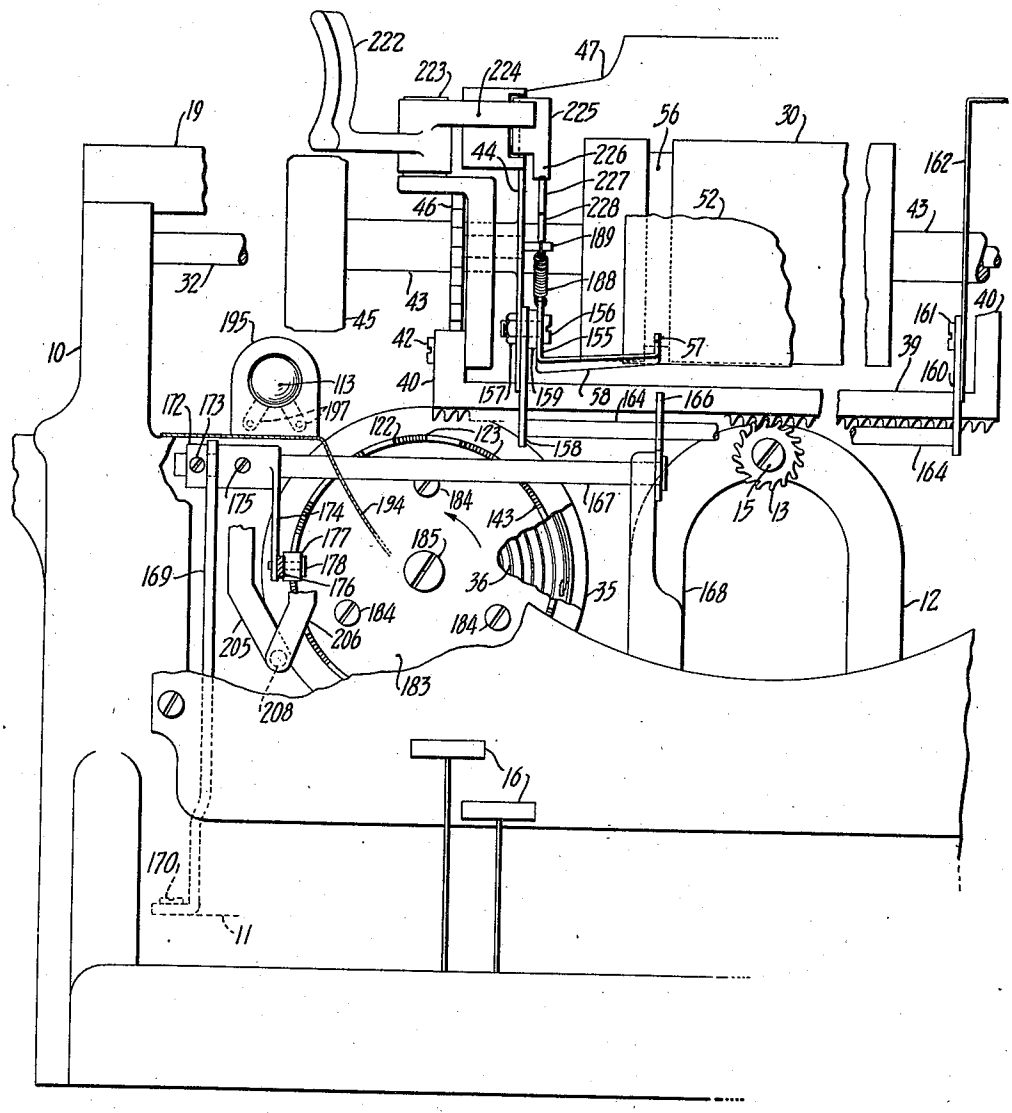


Fig.6.

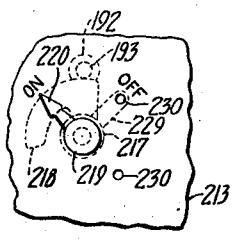


Fig.7.

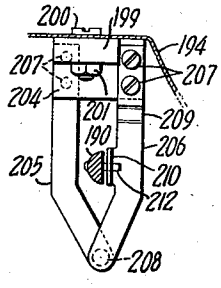


Fig.8.

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Patented May 2, 1939 2,156,475

UNITED STATES PATENT OFFICE

2,156,475

TYPEWRITING MACHINE

William F. Helmond, West Hartford, Conn., assignor to Underwood Elliott Fisher Company, New York, N. Y., a corporation of Delaware

Application February 20, 1937, Serial No. 126,875

24 Claims. (Cl. 197—189)

This invention relates to typewriters and particularly to page alarms and signals, or to devices for indicating how many lines remain unwritten on a page, by the actuation of a signal.

A feature of the invention is a jingling repetitious signal actuated by the carriage to indicate the position of a line. A repetitious alarm or signal, such as the tinkling of a bell, the twinkling of a light, or the flashing or blinking of a light-reflecting surface, for a substantial interval of time, has a positive attention-arresting power, that commands the attention of even the speedy operator.

A further feature of the invention is an improved device for varying the point, with reference to the bottom of the sheet, at which a signal is given.

Mechanism may be actuated by the line-space lever for rendering the signal inoperative during the carriage return.

Another feature is a camming-tooth rack for causing an intermittent actuation of the signal when the carriage is moved across the frame. In one form of the invention, the camming rack is mounted on the carriage and in another form the rack is mounted on the spring-drum.

Another feature is improved locking mechanism for holding the signal inoperative.

Other features are simplicity, the slight modifying of the typewriter and the low cost.

In one form of the invention, a circumferential groove is formed near the left end of the platen but removed from the end such a distance that a sheet of paper, in position for typewriting, normally overlies the groove, and a paper-feeler is pivoted on the carriage and spring-pressed into the groove so that when the bottom of the sheet is reached the paper-feeler drops into the groove and actuates a train of mechanism that closes an electrical circuit comprising a colored lamp suitably positioned on the typewriter for visibility. A knob on the left end of the carriage carries an index and is rotatable to set the mechanism to give a signal at the desired line removed from the bottom of the paper sheet. A slide on the top of the left end of the carriage is yieldably held in two positions, one operative and the other inoperative. The intermittent actuation of the signal is accomplished by a rack mounted at the rear of the paper-table and provided with a series of two-way camming teeth which are successively engaged by a dog that is mounted on the tabulator housing of the typewriter, as the carriage is moved across the machine. Other mechanism provides for the case-shifting of the platen-carriage with the present invention applied to the typewriter.

Another form of the invention utilizes a similar platen groove and paper-feeler. But the lever that pivotally mounts the paper-feeler on the inside of the carriage has an upper forward projection which is engageable by the line-space plunger and depressed to hold the paper-feeler out of the platen groove and so keep the electrical signal circuit open while the carriage is returned. The intermittent actuation of the signal light is obtained by a circular rack mounted on the spring-drum and having a series of camming teeth which are successively engaged by a roller on the end of a linearly reciprocating rod whose movement makes and breaks the electrical signal circuit. A knurled knob on the front of the typewriter turns a helical cam to hold the circuit-making rod out of contact with the camming teeth on the spring-drum. An index pointer on the front of the typewriter indicates the "on" and "off" positions of the line-signaling device. The construction also permits of case-shifting to upper and lower case positions.

In either form of the invention current may be derived from any electric-light socket, which usually delivers a current at approximately 110 volts.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is a left elevation, with parts sectioned and with parts removed, showing a camming-tooth rack for actuating the electrical switch at the extreme left, at the right an adjusting plate rotatably mounted on the platen axle and on the bottom of which the paper-feeler is pivotally mounted, and on the top of the left end of the carriage a slide for locking the mechanism in an inoperative position. In this view the paper-feeler is held in the non-signaling position by the paper sheet.

Figure 2 is a similar view but the paper sheet has passed the paper-feeler which has moved into signal-actuating position. The lower part of the figure shows the mechanism that permits platen case-shifting.

Figure 3 is a perspective view with parts broken away to show one of the embodiments of the invention.

Figure 4 is a similar view with the slide in the rearwards position to lock the mechanism out of operative position.

Figure 5 is a left elevation, with parts sectioned and with parts removed, showing a modification

of the structure of the preceding views and having a circular two-way camming-tooth rack mounted on the front of the spring-drum, a rod under control of the paper-feeler and reciprocatable lengthwise to engage the rack, a knurl on the front of the machine, for locking the rod, and an arm operated by the line-space lever for holding the paper-feeler out of the groove during carriage return.

Figure 6 is a front view of the modification, with parts in section and with parts removed, and showing the mechanism for making and breaking the electrical signaling circuit.

Figure 7 is a view of the knurl and the pointer showing the "on" and "off" settings.

Figure 8 is a front elevation showing the pivotal connection of the right spring of the switch with the insulated portion of the reciprocating rod for supporting the front end of the rod.

The improvements are shown in an Underwood standard typewriter having a frame 10, a key-lever bracket 11, an escapement housing 12 rotatably mounting an escapement pinion 13 and a ratchet-wheel 14, which are secured on the housing 12 by a screw 15, key-levers 16 for actuating type-bars 17, and a track rail 18 on which a platen-carriage 19 rides on brackets 20 depending beneath the rear of the carriage 19 from the crossbar 21. A tabulator housing 22 may be mounted centrally of and at the rear of the frame 10. The front of the frame 10 mounts a scale-bar 23 and the front cross-rods 24 and 25. The sides of the carriage 19 are shown broken away at the front. Shift-key levers 26 engage shift segments 27 which are mounted on a rock-shaft 28 in the frame 10, the segments 27 mounting at the front a track-rail 29 which is raised and lowered to shift a platen 30 supported at the ends on arms 31 secured, one at each end, on a compensating rod 32 rotatably mounted at the rear of the carriage 19. A spring-drum 35, containing a coil spring 36, is mounted in the frame 10 and winds a strap 37 which is also secured by a pin 38 to the carriage 19 to feed the latter in letter-spacing when a carriage rack bar 39, which is pivotally mounted (see Figure 6) on the carriage 19 by means of fixed end arms 40 and pivot screws 42 passing through the upper ends of said arms 40, engages the escapement pinion 13. The platen 30 is mounted on a shaft 43 which is rotatably mounted in side plate 44 of the carriage 19, by means of knobs 45 at the ends of the shaft 43, on the left end of which is a line-spacing rack-wheel 46. A paper-table 47 and rolls 48, 49, 50 feed a paper sheet 52 over the platen 30. A right-angled side plate 53 is mounted on an inwardly turned flange 54 of the side plate 44 and covers the end of the carriage 19. A wing scale 55 is mounted on the frame 10 in front of the platen 30. A roller 41 mounted on the carriage by a link 51 supports the carriage on the shift rail 29 and a keeper 61 keeps the roller 41 from jumping the track 29.

Referring to Figures 2, 3, and 4 a circumferential groove 56 is formed in the platen 30 near the left end. A paper-feeler 57 is mounted at right angles to and on an arm 58 which is turned inwardly at right angles to a lever 59 pivotally mounted by a pivot screw 60 fast on the lower end of an adjustable plate 62 rotatably secured on the shaft 43 and held in one vertical position against sidewise movement by a hub 63 and four quadrantly positioned screws 64. Mechanism for adjusting the plate 62 for varying the position of the paper-feeler 57 will be hereinafter more particularly described. The paper-feeler 57 is formed on the side toward the groove 56 with a right-angle cornered heel which presents opposite sides inclined at an angle of approximately 45° to the paper sheet 52. This facilitates the insertion of the front end of the paper sheet 52 and a not-too-abrupt movement of the paper-feeler 57 into the groove 56 at the end of the paper sheet 52.

The left end of the lever 59 terminates on the inner end of a hub 67 to the outer end of which is secured an arm 68 projecting rearwardly and supporting on the rear end a roller 69 which is held in the upper position shown in Figure 1 when the paper-feeler 57 is held out of the groove 56 by the paper sheet 52, and which is held in the lower position shown in Figure 2 when the bottom of the paper sheet 52 has been turned on the platen 30 to permit the paper-feeler 57 to be pulled into the groove 56 by means of a tension spring 70, the lower end of which is fastened to the front arm of the lever 59 and the upper end to an ear 72 projecting forwardly from the adjusting plate 62.

In moving from the position shown in Figure 1 to that shown in Figure 2 the roller 69 engages the concave forward edge of a scimitar-like arm 73 pivoted on a screw 74 fastened on the inside of the side wall of carriage end plate 44. A spring 75 is secured on the upper rear edge of the arm 73 and is tied to the inside of the plate 44 at 81 above and to the rear of pivot screw 74, so that the arm 73 is held in yielding contact with the roller 69. A link 76 is pinned to the upper end of the arm 73, extends rearwardly, and pivotally engages the lower end of a bail arm 77 fast on the left end of a rock-arm or bail proper 78 each end of which is rotatable in the upper rear ends of arms 79 fastened by screws 80 at either side of the paper-table 47. Only the left arm 79 is shown. Fixed to and depending from the bail proper 78 is a straight fin 82 which therefore swings forwardly and backwardly as the roller 69 rises and falls on the arm 73, or as the paper-feeler 57 rides on the paper sheet 52 or drops into the groove 56 when the signaling device is in the operative position. As the carriage 19 travels back and forth on the frame 10 the fin 82 slides along in a groove formed by two fingers 83 on an upstanding arm 84 of a bell-crank 85, the latter being pivotally mounted on an arm 86 by a pivot pin 87. The arm 86 is vertically mounted for case-shifting up-and-down motion by means of vertical slots 88 through which are passed headed screws 89 which are fastened horizontally in lugs 90 extending forwardly from the right end of the tabulator housing 22. A pin 92 (see Figure 2) in the lower end of arm 86 engages a horizontal slot 93 formed in the end of a horizontal arm 94 of a bell-crank 95 pivotally mounted on the vertical ear of a bracket 96 fastened by screws 97 to the key-lever bracket 11. The upper arm of the bell-crank 95 has at its upper end a lateral pin 98 which is engaged by a vertical slot 99 formed in the lower extremity of an arm 100 fixed on the bottom of the case-shift rock-shaft 28 so that when and as the platen 30 is shifted to upper-case position the arm 86 is also raised to upper-case position, and vice versa.

To the forward end of the forwardly projecting arm of the bell-crank 85 is pivoted a depending

link 102 pivotally connected at its lower end to an ear 103 upstanding on the upper metal arm 104 of a switch 105, the rear end of the arm 104 being hinged at 106 to a metal piece 107 fixed on the upper surface of an insulating block 108 which is pinned to the right side of the arm 86 by pins 111. The lower metal arm 109 is fixed on the lower surface of the insulating block 108. The electrical circuit 110 includes a lamp socket 112, positioned on the frame 10 in such a position that a lamp 113, which is preferably colored, is clearly visible to the operator, a switch 114 and a conventional plug 115 for connection with the usual house or office circuit of 110 volts. It is now clear that when the paper-feeler 57 drops into the groove 56 the switch 105 is closed, but that while the paper sheet 52 is holding the paper-feeler 57 out of the groove 56 the switch 105 is open.

To assure arresting the attention of the operator, the signal lamp 113 may be caused to twinkle or blink by the following mechanism: On the bail proper 78, to the rear of the fin 82, is a rearwardly and downwardly extending flange 120 terminating at the rear in a downwardly and forwardly extending rib 121 having formed along its bottom a series of teeth 122 formed by shallow notches 123. The teeth 122 are equidistant and are positioned a few letter-spaces apart. The teeth 122 and the intervening notches 123 are formed by straight sides that are low in pitch and form alternate similar and equal angles, and the series of teeth and notches extends entirely across the rear of the carriage forming a rack with a series of two-way camming teeth. A dog 125 has a top exactly identical in size and form with one of the teeth 122 or one of the notches 123, is mounted on a bracket 126 secured on the upper end and on the left side of the arm 86, and extends upwardly and rearwardly in parallel with the teeth 122 when they are in the engaging position shown in Figures 2 and 3. When the paper sheet 52 is in the position shown in Figure 1 and is holding the paper-feeler 57 out of the groove 56 the rib 121 is tilted upwardly and rearwardly away from the dog 125. But when the paper 52 is in the Figure 2 page-end-signaling position, the feeler 57 is in the groove 56 and permits the rib 121 to engage the dog 125. Then as the platen 30 and carriage 19 move along a line of typing, the rib 121 is cammed upwardly against the tension of the paper-feeler spring 70 to the height of the tooth 122, thereby rocking the shaft 78 clockwise, moving the fin 82 rearwardly and simultaneously tilting the upwardly extending arm 84 of the bell-crank 85 backwards on its pivot pin 87 to lift the link 102 and the upper metal arm 104 of the switch 105 to break the electrical circuit 110 and extinguish the lamp 113. And as the dog 125 is passed by the end of a tooth 122, the rib 121 moves downwardly together with the metal arm 104 to close the switch 105 and the electrical circuit 110 and light the lamp 113. The rapidity of the movement of the platen 30 and the carriage 19 across the typewriter determines the on-and-off frequency of the lighting of the lamp 113 so that for a speedy operator the lamp 113 twinkles more than ordinarily and proportionally.

It is clear that the distance of the paper-feeler 57 below the wing scale 55, or in advance of the platen printing point, determines at what line from the bottom of the paper sheet 52 the signal lamp 113 begins to twinkle. In the embodiment of my invention shown in Figures 1, 2, 3, and 4, the position of the paper-feeler 57 may be varied by adjusting the position of the pivot screw 60, which supports the inner end of the lever arm 59 on which the paper-feeler 57 is carried, with reference to the printing point approximate the wing scale 55, in order to give the page-end signal the fourth, fifth, sixth, seventh, or eighth single-space line from the bottom of the paper sheet 52. The pivot screw 60 is fixed on the bottom of the rotatable plate 62 and the plate 62 is so set that it is rotatable about the platen axle 43. The upper end of the plate 62 terminates in an arcuate toothed rack 124 of sufficient extent to move or adjust the paper-feeler 57 a distance equivalent to five line spaces on the paper sheet 52. A segment 127 has an arcuate toothed rack 128, similar to and engaging the rack 124, and is fixed on the end of a shaft 129 which is rotatably mounted in the vertical plate 44 and the vertical portion of the plate 53. Stop pins 132 and 133 on the plate 44 limit the movement of the segment 127. A hub 134 on the shaft 129 spaces the segment 127 from the plate 44. On the left end of the shaft 129 is mounted a small adjusting knob 135 having an index scale on its rim bearing the Arabic numerals "4", "5", "6", "7", and "8" which are so positioned with reference to a spring detent 136 mounted on the vertical portion of the plate 53 that when any numeral is opposite the detent 136 the paper-feeler 57 is positioned to begin to operate the signal the designated number of single-space lines from the bottom of the paper sheet 52. The detent 136 is mounted on the vertical portion of the plate 53 by means of a screw 137 and is yieldable to permit the knob 135 to be rotated to the several notches 138 in the right wall of the knob 135, one of which is opposite each numeral in the index scale.

The signaling device may be locked out of operation by a slide 139 which has at the front and rear elongated slots 140, 142 through which pass headed screws 143, 144 which guide the slide 139 and hold it slidably on top of the left side plate 53. A right-angled extension 145 of the slide 139 has a downwardly projecting stop 146 which is engageable with the upper right edge of the pivoted scimitar arm 73, when the slide 139 is pushed rearwards, to tilt the lower end of arm 73 forwards, which rocks the arm 59 to hold the paper-feeler 57 out of the groove 56. A small finger knob 147 is mounted on the slide 139 and contains a ball 148 which is downwardly pressed by a spring 149 into a front recess 150 or a rear recess 152 to hold the slide 139 in the adjusted positions.

A modification is shown in Figures 5, 6, 7, and 8 in which the paper-feeler 57 and its arm 58 are mounted on a rearwardly extending arm 155, the latter being pivotally mounted on a screw 156 passing through the left side plate 44 and secured by a nut 157 on the outside of the plate. Mounted on the screw 156 between the arm 155 and the plate 44 is a depending arm 158 secured by a hub 159 to the arm 155 so that arm 155 and arm 158 rock as a unit on the pivot screw 156. An arm 160 is similar to the arm 158 and is pivoted on a headed screw 161 exactly opposite the screw 156, the screw 161 being fastened on the inside of the right side plate 162. The lower ends of the arms 158 and 160 are tied together by a rod 164 which lies in a central vertical slot 165 formed in the upper end of an upstanding arm 166, thereby providing for case-shifting, the lower end of which is fixed on a rock-shaft 167 horizontally mounted at the right end in a

bracket 168 supported by the escapement housing 12. The left end of the rock-shaft 167 is mounted on a post 169 secured by screws 170 to the key-lever bracket 11. A collar 172 secured by a set-screw 173 to the left end of the shaft 167 provides for the facile assembly and mounting of the shaft 167. A depending arm 174 is set on the shaft 167 by a screw 175 and supports at its lower end on a pivot screw 180 the rear part of a shaft 176 to the rear end of which a roller 177 is pinned by a sidewardly extending pin 178.

In its rearward position the roller 177 is engageable with a circular camming-tooth rack 182 which, aside from being circular, is otherwise identical in size and form with the rib 121 and its teeth 122 and notches 123 in the other form of the invention shown in Figure 3. But the rack 182 is the rim of a cup-like disk 183 secured by screws 184 to the front wall of the spring-drum 35. In the center of the disk 183 is shown the spring-adjusting screw 185. As the carriage 19 moves across the frame 10, in either direction, the rack 182 rotates. The drum 35 is rotatably mounted (see Figure 5) on a hub 186 supported on an arm 187 mounted in the frame 10 and shown in section. When the paper-feeler 57 moves into the platen groove 56 the arm 158 rocks forwardly, together with the rod 164 and arm 160, swinging on an axis through the pivot screws 156, 161. The forward motion of the rod 164 rocks the arm 166 forwardly to turn the rock-shaft 167 clockwise of Figure 5 and move the arm 174 and the shaft 176 rearwardly to engage the roller 177 with the rack 182. The paper-feeler 57 is moved into the groove 56 by a spring 188 tied to the arm 155 and to a pin 189 transversely mounted on the left side plate 44, and it is clear therefore that the roller 177 is held yieldably against the rack 182 by the spring 188, and as the rack 182 rotates the shaft 176 is wigwagged to and fro to make and break an electrical circuit.

As shown in Figures 5 and 8 a piece of insulation 190 is pinned to the forward end of shaft 176 and formed at the front end into a disk 192 separated from the remainder of piece 190 by a reduced neck 193. A nest 194 supports a block of insulation 195 having a socket 196 for an electric lamp 113 at the left of the machine, with two electrical terminals 197 at the rear. A screw 198 secures the insulation 195 to the nest 194. A second block of insulation 199 is secured under the nest 194 at the front by a bolt 200 and nut 201, and at the rear a screw 203 passes up through the nest 194 into the insulating block 195. The block 199 has a central depending portion 204, on the rear of which is mounted the contact spring 205 and on the front of which is mounted the contact spring 206, by means of screws 207, on the left and on the right sides of the portion 204, respectively; and the lower ends of the springs 205 and 206 are turned inwardly to overlap and form a switch 208. The contact spring 205 is stationary but the upper or neck portion 209 of the contact spring 206 is made thinner so that the lower portion of the spring 206 is easily flexed forwardly and backwardly at the neck 209. A right-angled forwardly extending ear 210 is apertured to receive a pin 212 which is transversely mounted in the insulating piece 190. In the forward position of the roller 177 shown in Figure 5 the spring 206 is unflexed and the switch 208 is open, but when paper-feeler 57 moves into the groove 56 and roller 177 moves into one of the notches 123, the spring 206 is moved backwards and the switch 208 is closed. It is obvious that the rotation of the rack 182, when the carriage 19 is moved, causes the intermittent lightning of the lamp 113 because an electrical circuit 211, connected with any suitable source of electrical power, such as a 110-volt lighting circuit, includes the switch 208 which makes the lamp 113 twinkle.

If the shaft 176 be locked in the forward position shown in Figure 5 it is obvious that the switch 208 is also locked open. On the rear of the front plate 213 is mounted a bracket 214, by means of a rivet 215, the bracket 214 providing a rotatable bearing for a pin 216 extending rearwardly from a hub 217 the reduced front end of which has a bearing in the front plate 213. The hub 217 supports radially a helical cam 218, the outer edge of which lies in a geometrical cylindrical surface as indicated in Figure 7 that is contiguous to the neck 193, the left end of the helical cam 218 engaging the inside of the disk 192 as the hub 217 is rotated clockwise to lock the roller 177 in the forward position, or, in other words, to lock the switch 208 open. To rotate the hub 217 clockwise to engage the locking end of the helical cam 218 and the disk 192 a knurl 219, supporting an index pointer 220 on the outside of the front plate 213, rotates the hub 217 from the index position "on", towards the right, to the index position "off", in which latter position the switch 208 is locked open.

The Underwood typewriter has on the left end of the carriage 19 a combined carriage-return and line-space lever 222 rotating in a horizontal plane on a vertical post 223 and having a foot 224 which swings rearwardly to push back a line-spacing plunger 225 which has a downward extension 226 which engages the downwardly inclined forward end 227 of an upwardly and forwardly extending horizontal arm 228 that is a continuation of the rear end of arm 155 to move the paper-feeler 57 out of the groove 56 and so prevent the signaling while the carriage 19 is being returned to the right, but permitting a twinkling of the light, if the lock knurl 219 is "on" and a page-end has been reached, as the carriage travels in letter-spacing motion across the typewriter. On the inside of the front plate 213 a resilient finger 229 yieldably engages detent holes 230 and locks the index 220 in the "on" and "off" positions.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper-sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, and means for holding the paper-feeler out of the groove during carriage return.

2. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a line-space lever, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal ac-

tuated by said paper-feeler, and means operated by the line-space lever for holding the paper-feeler out of the groove, during carriage return.

3. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a line-space lever, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, and means operated by the line-space lever for moving the paper-feeler out of the groove.

4. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a line-space lever, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, and means operated by the line-space lever for moving and holding the paper-feeler out of the groove.

5. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a line-space lever, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, and an arm operated by the line-space lever for moving and holding the paper-feeler out of the groove.

6. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, a lever pivotally supporting the paper-feeler, an arm mounted on the lever, a line-space lever on the carriage, and means actuated by the line-space lever for engaging said arm to move the paper-feeler out of the groove.

7. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a line-space lever, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, a spring tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, and means operated by the line-space lever for holding the paper-feeler out of the groove during carriage return.

8. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, means for actuating the signal including an arm controlled by said paper-feeler, and means for detenting said arm to render the page-end signal inoperative.

9. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, means for actuating the signal including an arm controlled by said paper-feeler, a slide mounted on the carriage, and a detent mounted on the slide, said slide moving said detent into engagement with said arm to render the page-end signal inoperative.

10. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, means for actuating the signal including an arm controlled by said paper-feeler, a slide mounted on the carriage, and a detent mounted on the slide, said slide moving said detent into engagement with said arm to render the page-end signal inoperative and said slide being yieldably settable in both the operative and inoperative positions.

11. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler pivotally mounted on the carriage and movabe into and out of said groove, means tending to move said paper-feeler into said groove, a signal actuated by said paper-feeler, means for actuating the signal including an arm controlled by said paper-feeler, a detent for locking said arm, and a finger-piece for moving said detent into and out of engaging position.

12. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal-lamp, and mechanism conditioned by the paper-feeler for actuation by said carriage and including a cam-device co-operative with the carriage, when said mechanism is conditioned, for making and breaking an electrical circuit to light intermittently said signal-lamp.

13. In a typewriter, in combination, a frame, a letter-feeding carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal, and mechanism conditioned by the paper-feeler for actuation by said carriage, said mechanism including a series of cams mounted on the carriage and

also including a device actuable by said cams, when said mechanism is conditioned for actuating the signal intermittently throughout the typing of a line.

14. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, a signal, and mechanism conditioned by the paper-feeler for actuation, and including a series of cams mounted on the carriage and adapted to co-operate with the carriage for intermittently actuating the signal during the typing movement of the carriage.

15. In a typewriter, in combination, a main frame, a carriage mounted for reciprocatory movement thereon, a platen rotatable on the carriage and over which a paper sheet is passed to receive lines of typing, a groove in and near one end of the platen, a plate rotatable on the platen-axis, an arm pivoted on the plate, a paper-feeler mounted on said arm and overlying said groove, a spring connecting said arm and said plate and tending to hold said paper-feeler in said groove, an arm pivoted on the side of the carriage, said plate-pivoted arm engaging said carriage-pivoted arm to rock the last-named arm on its pivot, a spring fastened to said carriage-pivoted arm for restoring said last-mentioned arm when rocked, a stop on the carriage movable to engage said carriage-pivoted arm to hold it against rocking by said plate-pivoted arm and to hold the paper-feeler out of the groove, means for setting the plate in a plurality of rotatable positions, a bail pivotally mounted on the rear of the carriage by means of pivots on the ends of the bail proper, a link connecting said carriage-pivoted arm and an arm of the bail whereby as said carriage-pivoted arm is rocked said bail is rocked, a rack mounted on but offset from the bail proper and formed by oppositely-inclined camming surfaces, a cam fixed on the frame for engaging said rack to rock said bail, a fin mounted lengthwise on the bail proper, a bell-crank having a slot in one arm thereof that engages said fin, a switch, an electrical circuit, a signal light in said circuit and mounted on the frame, and an arm connected with the other arm of said bell-crank for opening and closing said switch as said rack moves over said cam.

16. In a typewriter, in combination, a main frame, a carriage mounted for reciprocatory movement thereon, a platen rotatable on the carriage and over which a paper sheet is passed to receive lines of typing, a groove in and near one end of the platen, a plate rotatable on the platen-axis, an arm pivoted on the plate, a paper-feeler mounted on said arm and overlying said groove, a spring connecting said arm and said plate and tending to hold said paper-feeler in said groove, an arm pivoted on the side of the carriage, said plate-pivoted arm engaging said carriage-pivoted arm to rock the last-named arm on its pivot, a spring fastened to said carriage-pivoted arm for restoring said last-mentioned arm when rocked, a stop on the carriage movable to engage said carriage-pivoted arm to hold it against rocking by said plate-pivoted arm and to hold the paper-feeler out of the groove, means for setting the plate in a plurality of rotatable positions, a bail pivotally mounted on the rear of the carriage by means of pivots on the ends of the bail proper, a link connecting said carriage-pivoted arm and an arm of the bail whereby as said carriage-pivoted arm is rocked said bail is rocked, a rack mounted on but offset from the bail proper and formed by oppositely-inclined camming surfaces, a cam fixed on the frame for engaging said rack to rock said bail, said fixed cam being mounted for carriage case-shifting, a fin mounted lengthwise on the bail proper, a bell-crank having a slot in one arm thereof that engages said fin, a switch, an electrical circuit, a signal light in said circuit and mounted on the frame, and an arm connected with the other arm of said bell-crank for opening and closing said switch as said rack moves over said cam.

17. In a typewriter, in combination, a main frame, a carriage mounted for reciprocatory movement thereon, a line-space plunger mounted on the carriage, a platen rotatable on the carriage and over which a paper sheet is passed to receive lines of typing, a groove in and near one end of the platen, a paper-feeler, an arm pivoted on a side plate of the carriage on which said paper-feeler is mounted, a spring mounted on said arm and tending to move said paper-feeler into said groove, an upwardly and forwardly extending arm mounted on said pivoted arm, a part actuated by the line-space plunger and engageable with said extending arm to lock said extending arm in a downward position and against upward movement to permit said paper-feeler to enter said groove, a depending arm fixed to said first two arms, an arm pivoted on the opposite side of the carriage on the same axis, a rod connecting the bottoms of the last two arms, a rock-shaft pivotally mounted on the frame, an upstanding arm on said rock-shaft having a slot engaging said rod, a depending arm on said rock-shaft, a shaft horizontally pivoted on said depending arm, a spring-drum for moving the carriage, a circular rack on said drum having a plurality of cams therein, a roller on the end of said shaft engageable with said cams, a switch supporting the other end of said shaft for lengthwise reciprocation, said switch being opened and closed by said shaft reciprocation and supporting the forward end of said shaft, an electrical circuit including an electric lamp controlled by said switch, a helical cam for locking said shaft in the open position of the switch, a knob for rotating said helical cam, and an index and scale on the front of the machine for indicating the position of said helical cam.

18. In a typewriter having a printing line, in combination, means for line-feeding a page past the printing line, a sensing-device adapted to sense a certain position of the page relatively to the printing line, means for adjusting said sensing-device relatively to the printing line to variably predetermine said position, a signal mechanism conditionable, for actuation by a certain operation of the typewriter, to give a signal concomitantly with said operation, and a universal operative connection between said signal mechanism and sensing-device adapted to enable the sensing-device, as it senses said position, to condition said signal mechanism at any adjustment of said sensing-device.

19. In a typewriter, in combination, types and a letter-feed mechanism co-operative therewith, line-spacing means for line-spacing a page relatively to a printing line of said types, a sensing-device adapted to sense a certain position of the page relatively to the printing line, means for adjusting said sensing-device relatively to the

printing line to variably predetermine said position, a signal mechanism conditionable, for actuation through operations of said types and letter-feed mechanism, to give a signal concomitantly with said operations, and a universal operative connection between said signal mechanism and sensing-device adapted to enable the sensing-device as it senses said position to condition said signal mechanism at any adjustment of said page-feeling device.

20. In a typewriter having a printing line, in combination, a frame, a letter-feed carriage mounted thereon, line-spacing means operable to line-space a paper sheet past the printing line, a sensing-device adapted to sense a certain line-spaced position of the paper sheet relatively to the printing line, an electrical circuit adapted to be closed automatically when said sensing-device senses said position, a signal actuable by means of said circuit when the latter is closed, and means moving synchronously with the carriage for alternately opening and reclosing said closed circuit, during the movement of the carriage, whereby an intermittent actuation of said signal is procured.

21. In a typewriter having a printing line, in combination, a frame, a letter-feed carriage mounted thereon, line-spacing means adapted to line-space a paper sheet past the printing line, a sensing-device adapted to sense a certain line-spaced position of the paper sheet, relatively to the printing line, an electrical circuit adapted to be closed automatically when said sensing-device senses said position, a signal actuable by means of said circuit when the latter is closed, and a camming-tooth rack co-operative with said carriage and adapted for opening and reclosing said closed circuit, whereby an intermittent actuation of said signal is procured.

22. In a typewriter, in combination, a frame, a carriage mounted for reciprocatory movement thereon, a rotatable platen on the carriage and over which a paper sheet is passed to receive lines of typing, a groove over which the paper sheet travels, a paper-feeler mounted on the carriage and movable into and out of said groove, means tending to move said paper-feeler into said groove, an electric signal-lamp, electric-contact mechanism conditioned by the paper-feeler to close a circuit to light said lamp, a row of cams mounted on the carriage, and means co-operative with said row of cams to open and reclose said closed circuit to cause said lamp to flash intermittently throughout the carriage movement.

23. In a typewriter having a printing line, in combination, a main frame, a work sheet platen, a case shiftable platen support mounted in said frame for lateral travel, a sensing device mounted on said support and adapted to sense a certain position of advance of said sheet relatively to the printing line, an actuatable signal mounted on said main frame, and mechanical connections, conditioned by said sensing device at said certain position, to translate the lateral travel movements of said platen support into intermittent actuation of said signal, said connections including devices enabling said connections to function irrespective of the case shifts of said support.

24. In a typewriter in which a work sheet is advanceable relatively to a printing line, in combination, a main frame, a laterally movable typing carriage on said frame, a sensing device on said carriage adapted to sense a certain position of advance of said work sheet, a cam device including two elements, namely, a series of cams and a cam follower, one element being adapted to move synchronously with said carriage and the other being mounted on said frame, said elements normally being out of operative relation, connections controlled by said sensing device to bring the element on said frame into operative relation with the other element, said connections including two members, on the carriage and frame, respectively, having sliding connection to permit relative movements of said members in the direction of carriage movements, and a signal device operable intermittently by the carriage movements through said cam device.

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