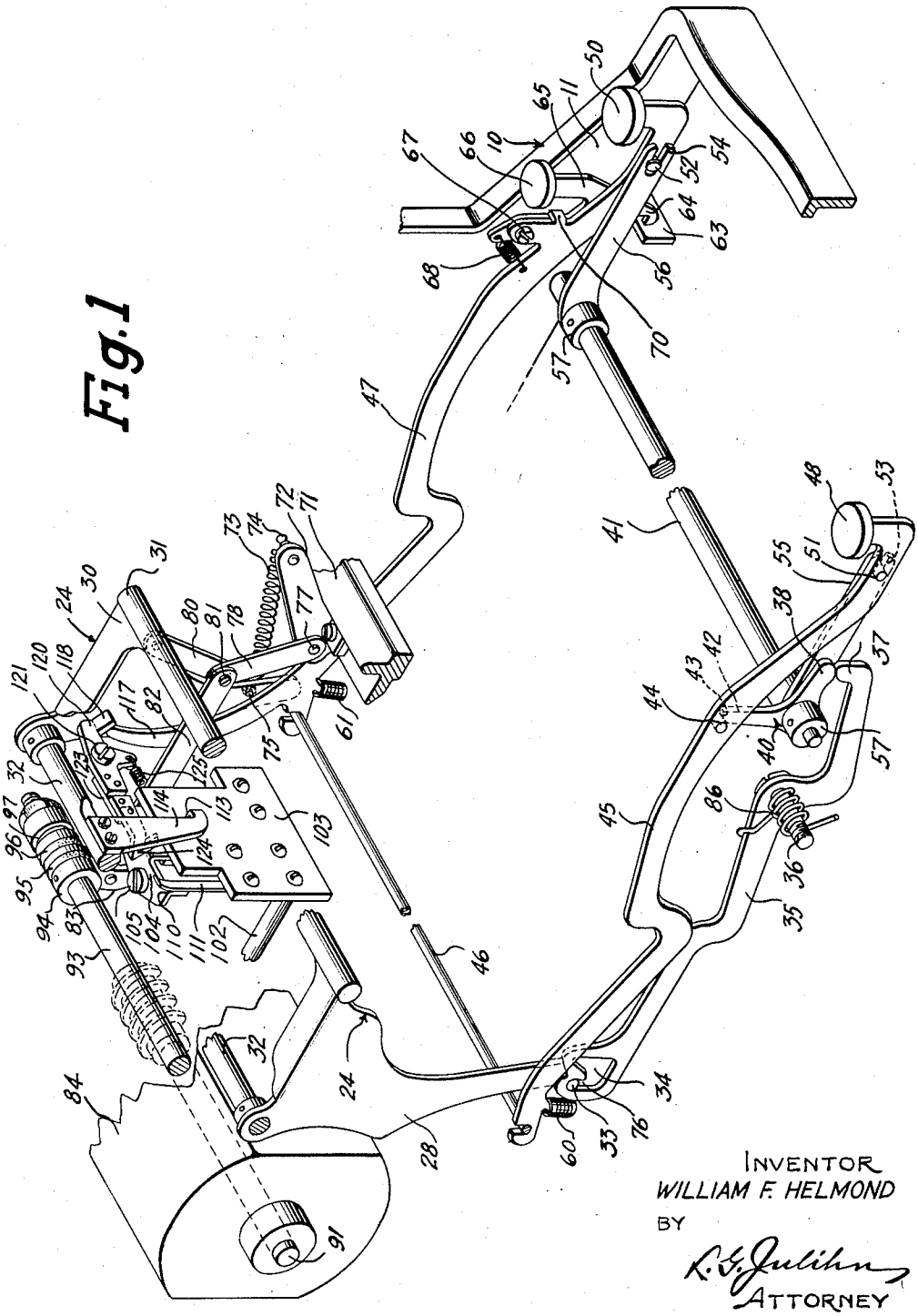
Dec. 2, 1941. W. F. HELMOND 2,265,072

TYPEWRITING MACHINE

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Fig. 1



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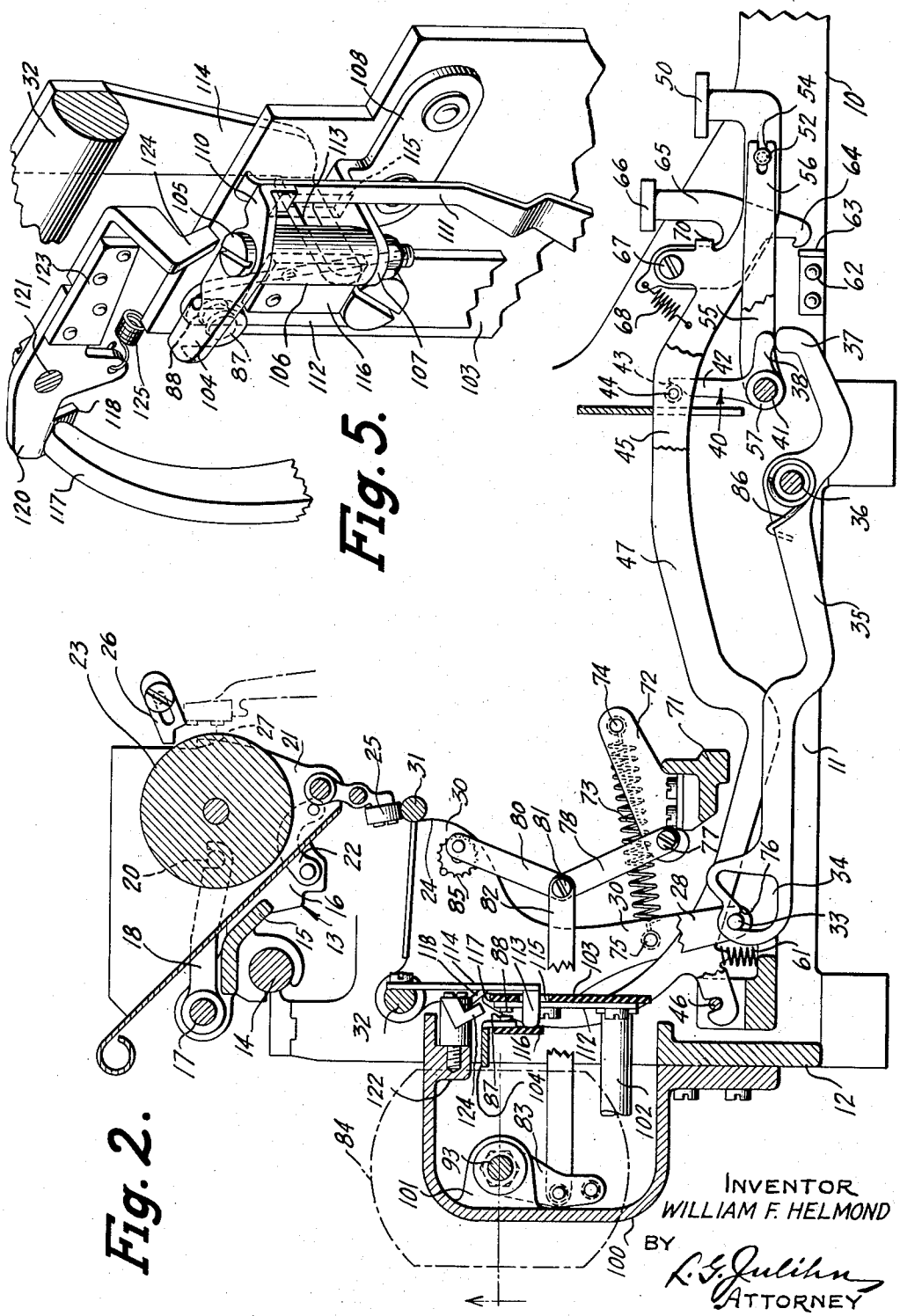


Fig. 5.

Fig. 2.

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TYPEWRITING MACHINE

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Fig. 6.

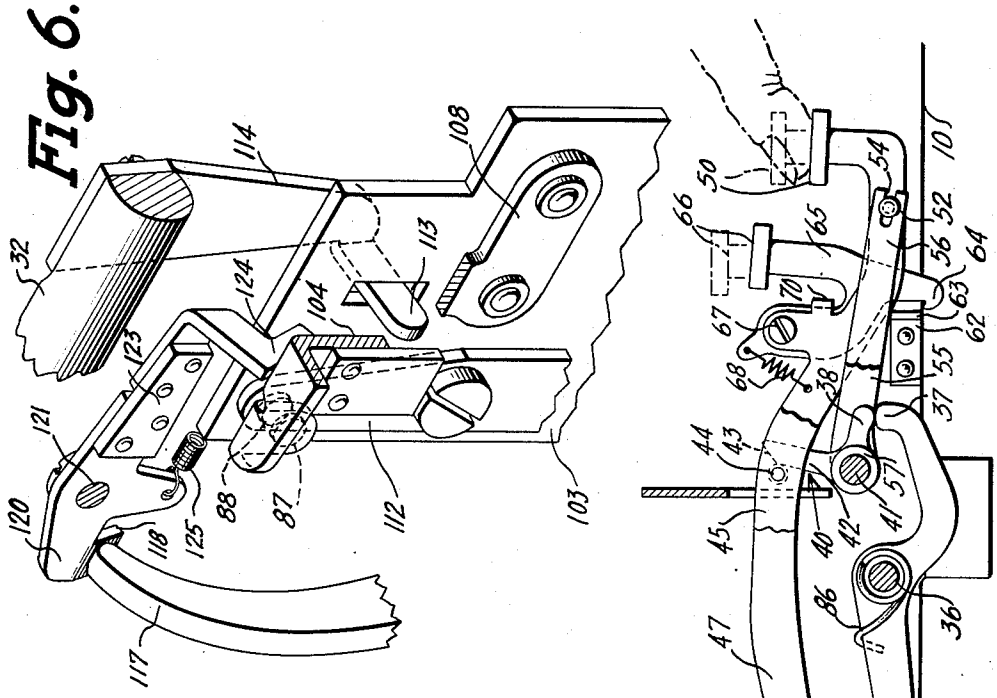
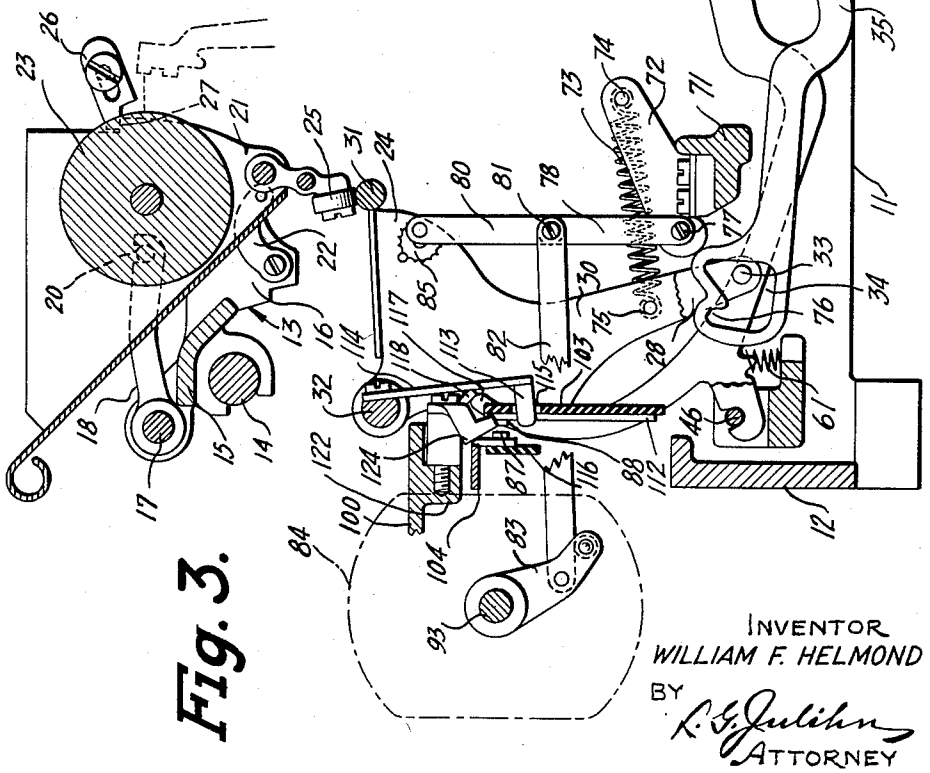


Fig. 3.



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TYPEWRITING MACHINE

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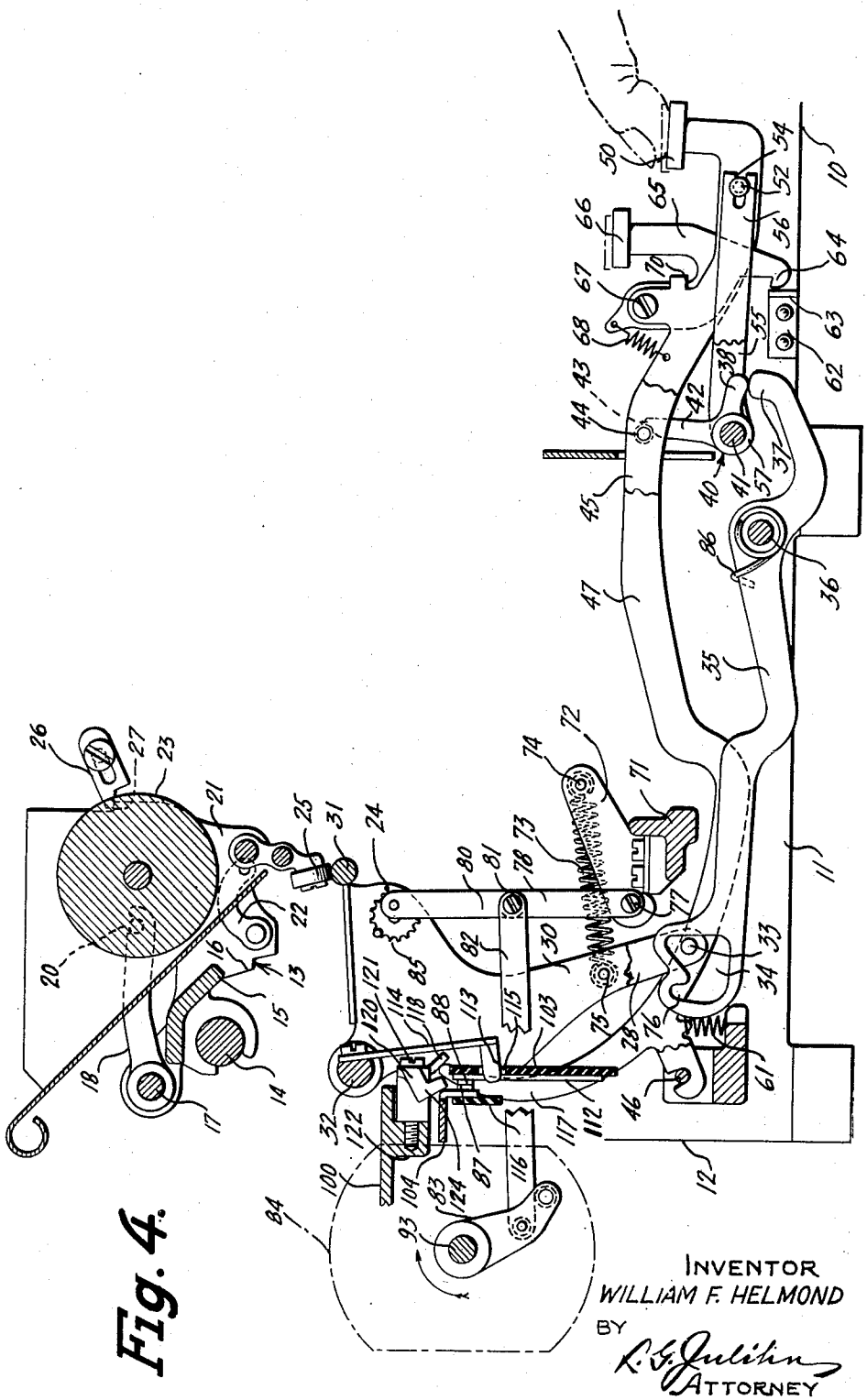


Fig. 4.

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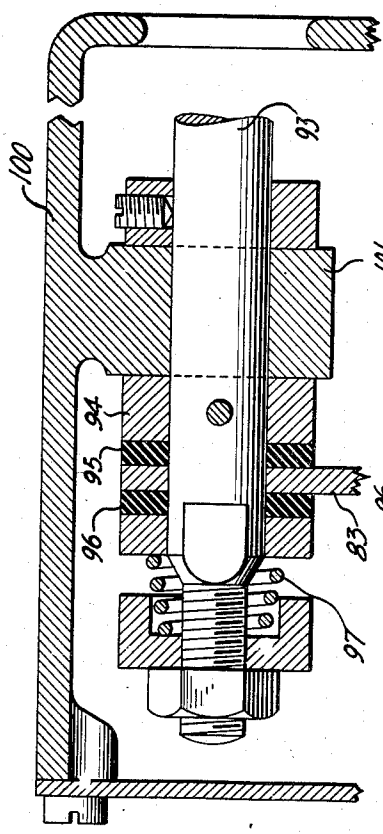


Fig. 8.

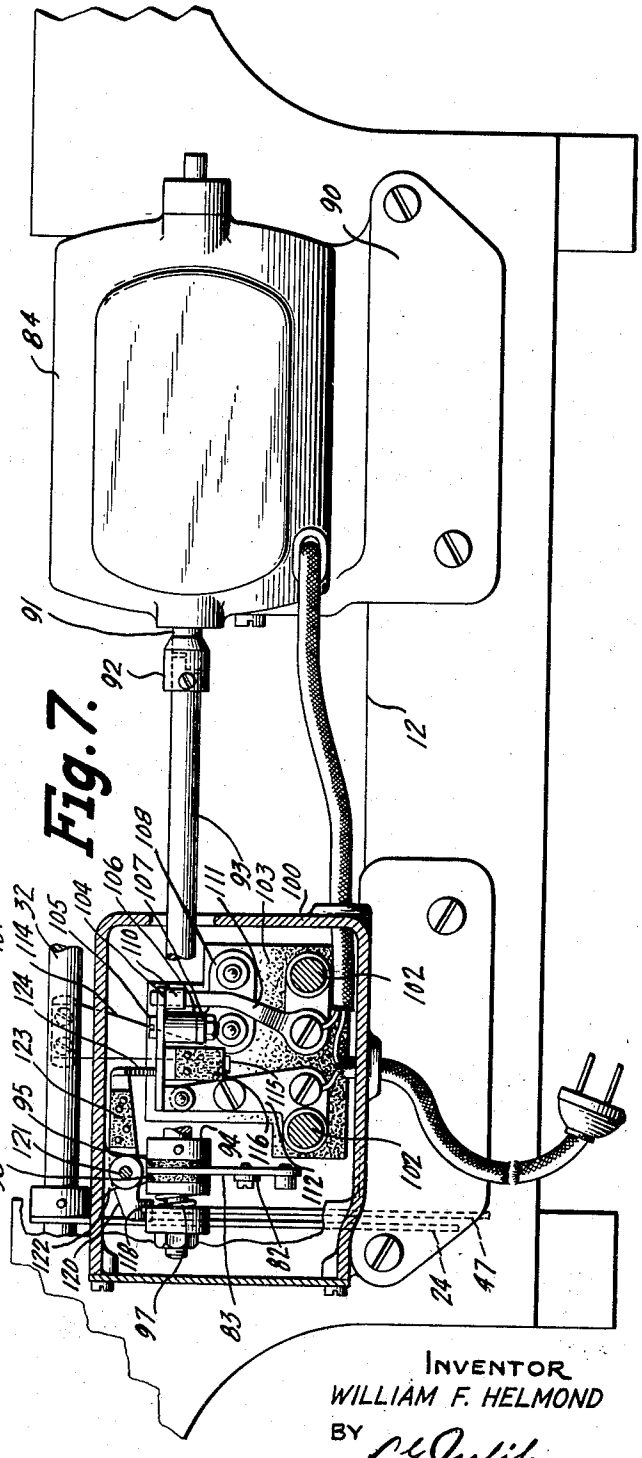


Fig. 7.

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2,265,072

TYPEWRITING MACHINE

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Application June 22, 1939, Serial No. 280,546

8 Claims. (Cl. 197—73)

This invention relates to typewriting machines and, with regard to certain more specific features thereof, to case-shifting devices particularly of the character in which electromagnetic means is employed in the operation of shifting from one case typing position to another.

The invention has for one of its objects to provide a simple, inexpensive and reliably operative means for shifting to different case positions with a minimum of operator effort.

It is another object of the invention to employ an electric motor in a normally open electric circuit in combination with simple key-controlled devices for latching in one case position the part to be shifted, releasing the part, by actuation of the key, to the influence of a spring to move the part to another case position, substituting suitable circuit controls, and then upon release of the key, closing the motor circuit to restore the shifted part by power to its original latched position.

Other objects will be in part obvious and in part pointed out particularly as the following description of a preferred embodiment of the invention proceeds.

In the drawings:

Fig. 1 is a view in perspective of the improved case-shifting mechanism.

Fig. 2 is a view in fore-and-aft section of a typewriter embodying the invention shown in Fig. 1, with the parts in normal or lower-case typing position.

Fig. 3 is a view similar to Fig. 2, but with the parts in the positions which they assume when a case-shift key is depressed and the platen is shifted to upper-case typing position.

Fig. 4 is a view similar to Figs. 2 and 3, but showing the parts in the positions which they assume when the case-shift key is released and has nearly returned to normal position. In this view the electric circuit has just closed and the motor is about to restore the parts to lower-case typing position, as they are seen in Fig. 2.

Fig. 5 is a fragmentary view in perspective showing the means for controlling the motor circuit. In this view the circuit contacts are closed for energization of the motor.

Fig. 6 is a view similar to Fig. 5, but with the circuit controls operated to maintain an open circuit even after the case-shift frame has been actuated by its spring to upper-case typing position.

Fig. 7 is a view of the rear of the typewriter showing the electric motor and its circuit controls.

Fig. 8 is a sectional view taken on the dot-and-dash line of Fig. 2, enlarged to show the details of the friction clutch employed in the motor drive.

Referring now more in detail to the drawings, a typewriter frame is indicated generally at 10. It has conventional side walls one of which is indicated at 11 and a rear wall 12. The typewriter carriage is indicated generally at 13 mounted for transverse movement on a way rod 14. A part of the carriage frame is shown at 15 and between end walls of this frame, one of which is shown at 16, a shaft 17 is mounted having lift hooks 18 at opposite ends taking under pins 20 of a movable skeleton 21. The skeleton is also pivotally connected to the carriage frame by end links 22. A roller platen 23 is suitably journaled in the skeleton and the latter has a roll bearing on a case-shift part or frame 24 as indicated at 25. An adjustable stop 26 is arranged in the path of a shoulder 27 of the skeleton to variably limit the movement of the latter to upper-case typing position.

The shift frame 24, shown clearly in Fig. 1, comprises opposite end members 28 and 30 connected by a cylindrical rod 31. The end members are fixed upon a shaft 32 suitably journaled in the side walls of the main frame of the typewriter. The lefthand end-member 28 of the shift frame extends somewhat below the end-member 30 and has a laterally extending pin 33 projecting into an aperture 34 at the end of a lever 35 pivotally mounted on the frame by a shoulder screw 36. The forward end of lever 35 has an ear 37 which is engaged by an arm 38 of a bell-crank lever 40 which is loose on a shaft 41 extending transversely of the machine and journaled in the side walls of the main frame. The other arm 42 of the bell-crank lever has a cam face 43 adapted to be engaged by a cam roll 44 projecting laterally from a case-shifting key-lever 45. The lever 45 is fulcrumed on a rod 46 extending between side walls of the frame and on the opposite side of the machine a case-shift key-lever 47 corresponding in shape to the key lever 45 is also fulcrumed on the rod 46. Key levers 45 and 47 have keys 48 and 50, respectively, at their forward ends, and at these ends are fixed pins 51 and 52 respectively resting in slots 53 and 54 of arms 55 and 56 each of which is fixed to shaft 41. Thus as either key 48 or 50 is depressed, the other key and its lever will also be depressed. A collar 57 is fixed on the shaft 41 to hold the bell-crank lever 40 in appropriate transverse position so that arm 38 will be maintained over the ear 37 and cam 43 is maintained in position to be operated by the cam roll or pin 44 on the lever 45. Springs 60 and 61 tend to urge the case-shift keys into their upper posi-

tions. A bracket 62 has one arm secured to the right side wall of the main frame and another arm 63 extending inwardly to provide a latching shoulder for a hook 64 on an upper-case-latching lever 65. This lever has a key 66 and is pivoted at 67 to the case-shifting lever 47 being normally held in unlatched position by a spring 68 connecting a short arm of the lever 65 with the key lever 47. A lug 70 limits the movement of lever 65 under the action of spring 68. When either of the case-shift levers 45 or 47 is depressed the other will move accordingly and both may be maintained in depressed position by depression of key 66 moving hook 64 under the arm 63 of the latch bracket, and at the same time releasing pressure on the case-shift lever.

Fixed on a cross bar 71 of the main frame is a bracket 72 which anchors one end of a coil spring 73 at 74. The other end of the spring is anchored at 75 to the right-side end-piece 30 of shift frame 24. The spring is normally under tension tending to lift the shift frame and move the platen roller 23 to upper-case position, but this movement is normally prevented by engagement of pin 33 of the left-side end-piece 28 in a latching portion 76 of aperture 34 at the rear of lever 35.

Pivotally mounted on bracket 72 at 77 is one link 78 of a toggle, the other link of which is indicated at 80. At the center of the toggle there is a pivotal connection at 81 with a link 82 which extends rearwardly to a connection with an arm 83 on an extension of the armature shaft of an electric motor indicated at 84. The upper end of link 80 is pivotally connected through an adjusting device 85 with the right-side end member 30 of the case-shift frame 24.

In Figs. 1 and 2 of the drawings the parts are shown in their normal or lower-case typing positions. Spring 73 is under tension but case-shift frame 24 is held down around its shaft pivot 32 by engagement of the pin 33 in the latch portion 76 of aperture 34 at the rear of lever 35. When either of the case-shift keys 48 or 50 is depressed both levers 45 and 47 move downwardly around fulcrum rod 46 and in doing so the cam roll or pin 44 on lever 45 acts upon cam face 43 of bell-crank lever 40 swinging it clockwise, as viewed in these figures, producing downward movement of the forward end of lever 35 against the action of its return spring 86 to raise the rear end of the lever and allow pin 33 to escape from the latch portion 76 of aperture 34. Thereupon spring 73 pulls the shift frame 24 forwardly around the shaft pivot 32 and raises the cylindrical rail 31, thus lifting skeleton 21 and platen roll 23 until the stop shoulder on the skeleton abuts stop 26. Thus the platen roll is thrown to upper-case typing position by the spring 73 upon depression of either case-shift key.

The electric motor 84 is in an electrical circuit which is normally open through contact pair 87—88. The motor is mounted on a bracket 90 fixed to the rear wall 12 of the main frame. Its armature shaft 91 drives, through a coupling 92, a shaft 93 which has a fixed clutch collar 94. Between the clutch collar 94 and the actuating arm 83 there is a disk 95 of friction material and on the other side of arm 83 is a similar friction disk 96 urged against arm 83, which is loose on the shaft, by an adjustable spring-pressure device 97. Reference to Figs. 3 and 4 of the drawings will demonstrate that the toggle 78—80 is substantially straightened by the action of spring 73 in moving the case-shift frame to upper-case typing position. The friction at clutch 95—96 is sufficient to transmit motion from the armature shaft 91 to actuating arm 83, to swing this arm in a clockwise direction, as viewed in Fig. 4, and thus break the toggle, return the case-shift frame to lower-case typing position and retention spring 73. The friction clutch permits slippage after the motor has achieved these results.

The controls for the normally open circuit of the electric motor will now be described. A control box 100 is mounted upon the rear wall 12 of the main frame, is penetrated by the armature shaft extension 93, and houses the friction clutch 95—96. A flange 101 of the control box provides a bearing for one end of the armature shaft extension 93. Secured to the control box on posts 102 is a panel 103 of insulating material to which is fixed contact 88 of the contact pair 87—88. Contact 88 serves as the fixed contact of the pair. Contact 87 is mounted upon an angle member 104 which is pivoted at 105 on a post 106 supported by a flange 107 of a bracket 108 which is in turn fixed to the vertical insulating panel 103. The angle member 104 has a tail 110 on the opposite side of the pivot 105 from the contact 87, and against this tail a leaf spring 111, supported at its lower end by panel 103, bears with a tendency to close the contact pair.

Angle member 104 and leaf spring 111 are of electrical conductivity, as is also a strip 112 secured to the panel 103 and carrying contact 88. The electrical circuit is from one side of a line through strip 112, fixed contact 88, movable contact 87, angle member 104, leaf spring 111, to one side of the motor, and from the other side of the motor back to the opposite side of the line.

When the parts of the case-shifting mechanism are in normal or lower-case position, as shown clearly in Fig. 2 of the drawings, an electric circuit is maintained open through the contact pair 87 and 88 by a finger 113 on the lower end of an arm 114, the upper end of which is secured to shaft 32 of the case-shift frame. As the frame rocks to lower-case typing position, finger 113 enters an aperture 115 in the panel 103 and, striking against an insulating block 116 secured to the angle member 104, it rocks the angle member on its pivot 105 to open the contact pair against the opposition of leaf spring 111. Thus as long as the case-shift frame remains latched in lower-case typing position, as shown in Fig. 2, finger 113 is effective to maintain the motor in an open electrical circuit.

When either of the shift keys 48—50 is depressed, the case-shift frame is rocked and finger 113 is relieved from its effective open-circuiting position. But before contacts 87 and 88 may become closed, a substitute open-circuiting device becomes effective. This substitute device comprises a riser 117 at the rear of case-shift key-lever 47. The upper end of the riser engages a cam member 118 at one end of a lever 120 which is pivoted at 121 in a lug 122 on control box 100. The lever is of metal suitably insulated, as indicated at 123. The opposite end of the lever has a nose 124 which wedges into position between panel 103 and angle member 104 when the cam 118 of the lever is acted upon by riser 117. A spring 125 is adapted to rock the lever to withdraw the nose 124 when riser 117 is retracted.

Thus when the operator depresses one of the case-shift keys, allowing the case-shift frame to rock to upper-case typing position, the open circuit control of finger 113 is abandoned in favor of an open circuit control by the nose 124, which

is in turn under control of the case-shift key-lever. The nose is so shaped and the parts are so related that closure of the contact pair does not take place until the case-shift key-lever has returned to a considerable extent from its fully depressed position. The approximate point of contact closure is illustrated in Fig. 4 of the drawings.

As the case-shift lever is released to its upward movement under the influence of springs 60—61 the cam roll 44 is relieved from the bell-crank lever 40, which allows the latch lever 35 to return under the influence of its spring 86 so that it reassumes a position for engagement with the pin 33 of the case-shift frame when the latter is restored to lower-case typing position. With the parts substantially in the positions shown in Fig. 4 of the drawings, the contacts 87—88 are engaged, the motor 84 is energized, the arm 83 is moved by the friction clutch, pulling link 82 to break the toggle 78—80 and rock the case-shift frame until pin 33 rides into latch groove 76 of latch lever 35. The skeleton 21 with roller platen 23 follows by gravity the downward motor-driven movement of the case-shift frame and finds its lower case typing position determined by the latched position of the case-shift frame.

When the case-shift lock-lever 65 is used to latch the parts in upper-case typing position, case-shift key-lever 47 is held depressed and riser 117 is held elevated in the same manner as though key 50 would be held depressed by the operator's finger. Thus nose 124 continues to maintain the motor circuit open under these conditions until the operator depresses one or the other of case-shift keys 48 and 50 slightly below the position which they assume when the latch lever 65 is effective. This releases the latch lever to the action of its spring 68, withdrawing hook 64 from latch shoulder 63 destroying the effectiveness of the latch and permitting restoration of the key-lever 47 which then permits withdrawal of nose 124 and closure of the electric circuit.

By the system of circuit controls just described it will be obvious that the spring and motor shifting of the roller platen to upper and lower case-shift positions respectively may be utilized under all operating conditions of the machine irrespective of whether the left-hand or the right-hand case-shift key is depressed or released, or whether the case-shifting is to be effected temporarily for the typing of a single character, or is to be effected for the typing of a plurality of characters. Operator effort is reduced to a minimum and the device is characterized by particular simplicity and reliable operation.

It will be noted, furthermore, that the shifting of the parts to upper-case typing position may require a spring of considerable strength particularly on wide carriage machines. The present invention is adapted to greatly reduce the shock of impact as the parts arrive at their upper-case stop position. The straightening of the toggle to obtain upper-case typing position results, of course, in decelerating the movement of the parts as they proceed toward the limiting stop and the ready slip of the friction clutch between the motor and the toggle minimizes the shock.

What is claimed is:

1. In a typewriter, a case-shift device comprising, a part to be shifted, latch means holding the part normally in lower-case typing position, a key, connections between the key and the latch means for rendering the latch means ineffective when the key is depressed, spring means for moving the part to upper-case typing position when the latch means is rendered ineffective, electric current responsive means in a normally open electric circuit, means under control of the key in its return after depression for closing said electric circuit and means connecting said current responsive means to said part to restore the latter to lower-case typing position.

2. In a typewriter, a case-shift device comprising, a part to be shifted, latch means holding the part normally in lower-case typing position, a key, connections between the key and the latch means for rendering the latch means ineffective when the key is depressed, spring means for moving the part to upper-case typing position when the latch means is rendered ineffective, an electric motor in a normally open electric circuit, means under control of the key in its return after depression for closing said electric circuit and means connecting said motor to said part to restore the latter to lower-case typing position, said latch means being rendered effective upon said return of the key to automatically relatch the part when restored.

3. In a typewriter, a case-shift device comprising a shift-frame, spring means applied to said shift-frame to bias it to a predetermined case position, an electric motor, connections between said motor and said shift-frame, means for latching the shift-frame against the bias of said spring means, a key-lever, and means controlled by said key-lever to render said latching means ineffective upon depression of said key-lever and to render said motor effective to return the shift-frame to latched position upon return of said key-lever.

4. In a typewriter, a case-shift device comprising, a shift-frame, spring means applied to said shift-frame to bias it to a predetermined case position, an electric motor, connections between said motor and said shift-frame including a toggle adapted to be straightened by said spring means, means for latching the shift-frame against the bias of said spring means, a key-lever, and means controlled by said key-lever when moved in one direction to render ineffective said latching means and upon movement of the key-lever in another direction to render said motor effective to break the said toggle and return the shift-frame to latched position.

5. In a typewriter, a case-shift device comprising, a shift-frame, spring means applied to said shift-frame to bias it to a predetermined case position, an electric motor, connections between said motor and said shift-frame including an arm on the armature of the motor, a toggle, between the shift-frame and a stationary part of the typewriter, adapted to be straightened by said spring means, a link between said arm and said toggle, means for latching the shift-frame against the bias of said spring means, a key-lever, and means controlled by said key-lever to release said latching means upon depression of said key-lever and to render said motor effective to break said toggle and return the shift-frame to latched position upon return of said key-lever.

6. In a typewriter, a case-shift device comprising, a shift-frame, spring means applied to said shift-frame to bias it to a predetermined case position, an electric motor, connections between said motor and said shift-frame including a slip friction drive, an arm on the armature of the motor, a toggle between the shift-frame and a stationary part of the typewriter adapted to be

straightened by said spring means, and a link between said arm and said toggle, means for latching the shift-frame against the bias of said spring means, a key-lever, and means controlled by said key-lever to release said latching means upon depression of said key-lever and to render said motor effective to break said toggle and return the shift-frame to latched position upon return of said key-lever.

7. In a typewriter, a part to be shifted to different positions, latch means holding the part normally in one of said positions, a key, connections between the key and the latch means for rendering the latter ineffective when the key is depressed, spring means for moving the part to another of said positions when the latch means is made ineffective, electric current responsive means, in a normally open electric circuit, adapted to restore the part to the first said position when the circuit is closed, and means, including a circuit controlling device influenced by the depression and restoration of said key, to maintain the circuit open when the key is depressed and close the circuit during the restoration of said key.

8. In a typewriter, a case shift device comprising, a part to be shifted to different case positions, latch means normally effective to hold the part in one case position, spring means for moving the part to another case position, electric current responsive means to return the part to the said one case position, a circuit for the last said means including movable contacts, means including a member on said part for holding the contacts normally disengaged, another means for holding the contacts disengaged, a key and means controlled by the key for releasing the latch means and rendering effective the said other contact-holding means when the key is moved in one direction, said key-controlled means having provision for restoring the latch and said other holding means to normal condition when the key is moved in the opposite direction.

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