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[54] **KEY LOCK SHIFT MECHANISM**
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[50] **Field of Search** 197/71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 98, 99, 106, 107, 108, 110, 16

[56] **References Cited**

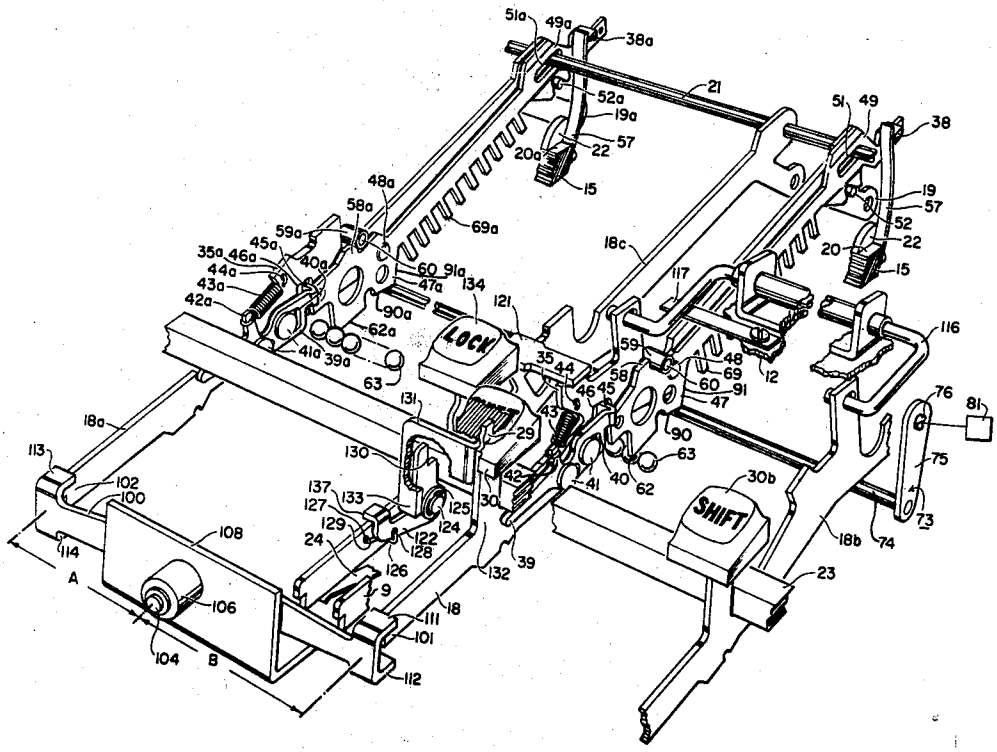
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ABSTRACT: A key lock mechanism for a keyboard wherein a shift key lever and a key lock lever are mutually coupled by bridging members spanning intermediate key levers to latch and unlatch the shift key lever for deriving a compact, shallow keyboard.



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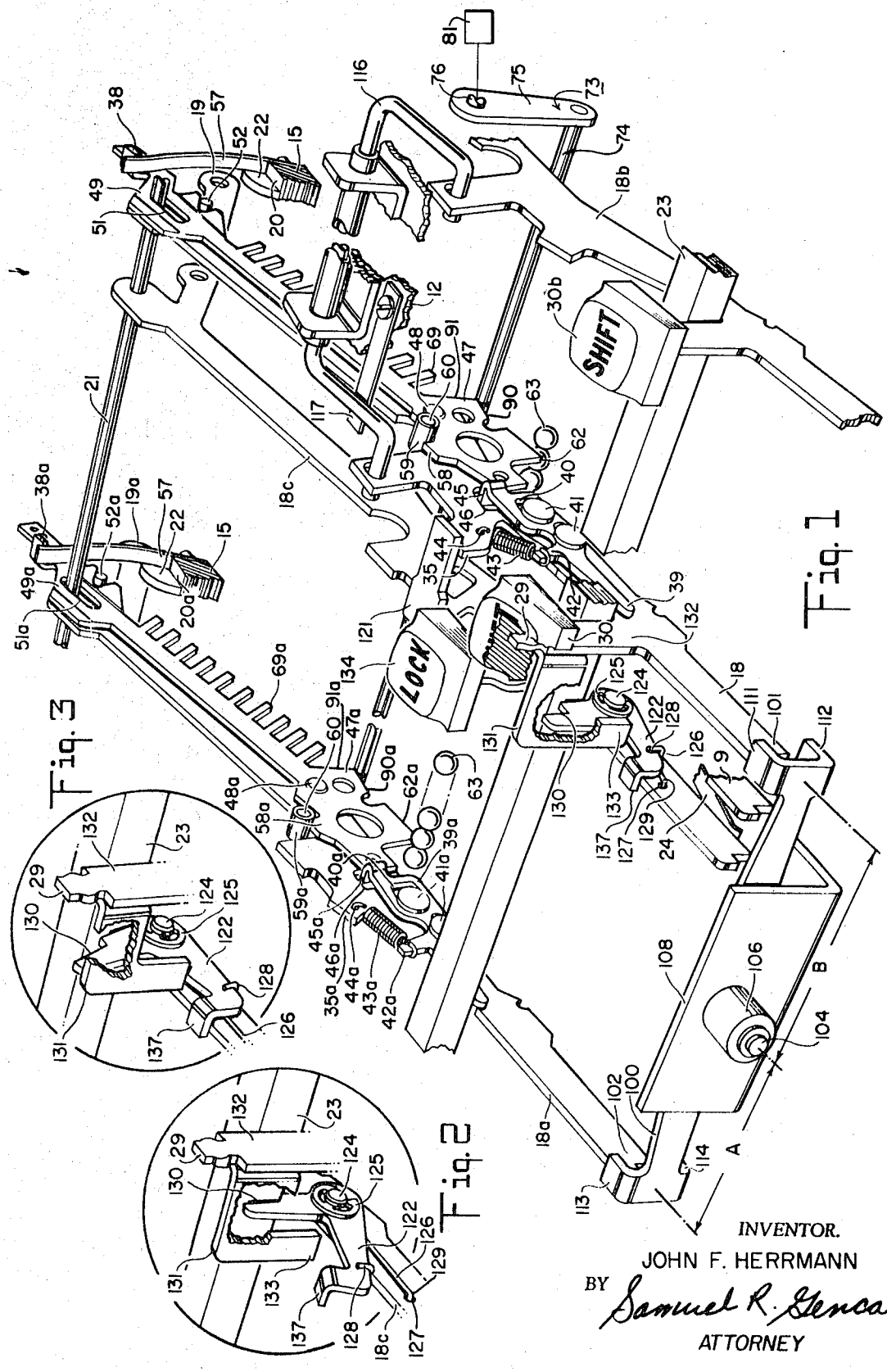


Fig. 1

Fig. 3

Fig. 2

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KEY LOCK SHIFT MECHANISM

The present invention relates to a keyboard mechanism and, more particularly, to a key lock mechanism for a key board mechanism.

Although the present invention is suited for more general applications, it is particularly adapted for use in a key lock shift mechanism for a typewriter keyboard. Shift and unshift functions in an electric keyboard are well known to those skilled in the art. In the past, complex electronic shift and shift lock devices have been used to lock the shift key when in a down or shifted position. Other attempts have used mechanical means which include a lock mechanism mounted directly on the shift key lever. Although the prior art mechanisms have operated satisfactorily for the purpose intended, they have the disadvantage of being complex and costly.

Accordingly, it is an object of the present invention to provide a new and improved key lock shift mechanism which avoids one or more of the disadvantages and limitations of prior art mechanisms.

It is a further object of the invention to provide a novel key lock shift mechanism of compact and relatively simple construction and which exhibits smooth yet firm key manipulation together with quiet operation.

It is yet a further object of the invention to provide an improved keyboard mechanism possessing high versatility for numerous and diverse applications, combined with consistent dependability over prolonged periods of operation.

It is still another object of the invention to provide a relatively simple and inexpensive key lock shift mechanism for a signal responsive typewriter.

Briefly described, the present invention accomplishes the above and other objects in a key lock shift mechanism in one embodiment of the invention, by providing a key lock shift mechanism which coacts with first and second shift key levers wherein said first shift key lever, when actuated, generates a code indicative of the fact that succeeding codes are to be interpreted as representing upper case letters and characters; and wherein said second shift key lever, when actuated, generates a code indicative of the fact that codes generated subsequent thereto are to be interpreted as codes representing lower case letters and characters. The named first shift key lever may appropriately be designated a shift key lever and the second shift key lever may appropriately be designated the unshift key lever. The shift key lever and the unshift key lever are coupled by a rocker arm lever which is pivotal at a midpoint or at some point along its length. The rocker arm lever coacts with the shift and unshift key lever to maintain an out of phase relationship so that the operation of one of the key levers produces one of the codes and the return of that key lever effects the operation of the other key lever through the rocker arm to produce the other code. In accordance with the invention, the key lock shift mechanism includes a key lock lever which is disposed parallel to the shift and unshift key levers in spaced relationship so that other key levers may be interposed therebetween and said key lock lever rests against a stop bar when the key levers are in the normally up position. Also included is a pawl rotatably mounted on the key lock lever and normally urged in a clockwise direction towards the stop bar by a biasing spring. The pawl includes an arm positioned in cooperative relationship with the key lock lever for urging the key lock lever downwards when the pawl is rotated counterclockwise. The key lock lever includes a first tab bridging other key levers disposed between the shift key lever and the key lock lever. The first tab is coupled to the shift key lever so that the shift key mechanism is urged in a downward position whenever the shift lock key lever is urged in the same direction. The shift key lever includes a second bridging member which coacts with the pawl to rotate it in a counterclockwise direction whenever it is depressed in a downward position to keep the pawl from engaging the stop bar and conversely when the key lock lever is depressed within its limit of travel, the pawl is decoupled from the shift key lever and rotated against the stop bar to retain the key lock lever and the key shift lever in the down or shifted position.

Other and further objects and advantages of the invention will appear as the detailed description thereof proceeds in the light of the drawing forming a part of this application and in which:

FIG. 1 is a schematic view of one embodiment of the key lock shift mechanism embodying the present invention with some parts removed and others broken away to better illustrate the invention;

FIGS. 2 and 3 are fragmentary perspective views of the key lock shift mechanism in latched and unlatched positions, respectively.

The present invention may be embodied in a variety of different typewriter keyboards and, is shown by way of example in FIGS. 1—3, in one embodiment of the structure shown in U.S. Letters Pat. No. 3,327,828 entitled "Keyboard Mechanism Having Latch Means," issued June 27, 1967, to Hugh St. Lawrence Dannatt and assigned to the same assignee as the present application. Only the structure necessary to show the invention is illustrated in FIGS. 1—3. For a more complete description of the keyboard mechanism, reference may be made to the above-mentioned patent which is hereby incorporated by reference.

Referring now more particularly to FIGS. 1—3 of the drawing, a key lock shift mechanism embodying the present invention is shown in a keyboard structure comprising a base plate **12**, spacer bar **15**, upper case or shift key levers **18** and **18***b* and a lower case or unshift key lever **18***a*. The key levers **18** and **18***a* are positioned in spaced relation and are supported for pivotal motion on rod **21** and have integrally formed and laterally extending rear arms **19** and **19***a*, respectively, which are received in individual comb slots **20** and **20***a* of the spacer bar **15**. The key levers **18**, **18***a*, and **18***b* are aligned with comb teeth **22** of the spacer bar **15**. The shift key lever **18** and the unshift key lever **18***a* have similar features and structures which for the convenience of the reader will be similarly numbered except that a small letter *a* will be added to each element associated with the unshift key **18***a*. In the following description, the operation of the shift lever **18** will be described. However, it follows that the operation of the unshift key lever **18***a* is also described by substituting the phrase "unshift key lever **18***a*" for the phrase "shift key lever **18**" and adding an *a* after the numerical designation for the appropriate elements. Exceptions to this general rule will either be obvious or noted herein. The key levers **18**, **18***a*, **18***b*, **18***c* are biased upwardly against a common transverse stop bar **23**, by a comb spring **24**. To minimize congestion in the drawing, spring **24** is shown under key lever **18***c* only. It should be understood that similar biasing springs **24** are provided under each of the similar key levers such as **18**, **18***a*, etc. The unshift key lever **18** *a* is normally held in a depressed or down position when the shift key lever **18** is in a normal rest position or up position in a manner to be explained hereinafter.

The key lever **18** includes a laterally extending and forwardly positioned projection **29** which is adapted to be received and retained in a socket of a shift key button **30**. The key levers **18** and **18***a* are spaced apart to provide spacing for a plurality of key levers (not shown) which are retained in a spaced parallel arrangement.

Elongated pawl **39** has a central longitudinal slot **40** and is supported for angular and longitudinal movement on the side of key lever **18** by enlarged hear head stud **41** extending through the slot **40**. Each pawl **39** is provided with a lateral projection **42** which anchors one end of bias spring **43**, the other end of which is received in aperture **44** of projection **35** provided on the adjacent and associated key lever **18**. The spring **43** biases the pawl **39** in a clockwise direction normally to engage, in the rest position of its associated key lever **18**, the forward end of the pawl **39** with the stop bar **23**. The rear end of each pawl **39** is bent over laterally to provide an actuating projection **45** which extends through an aperture **46** of the key lever **18** and into engageable relation with the forward end of a slide member **47** associated with key lever **18** and supported for pivotal and longitudinal movement in a manner now to be considered.

As just indicated, there is associated with key lever **18** a slide member **47**. The slide member **47** is positioned in side-by-side relation with its associated key lever **18** but is maintained in slight spaced relation to the associated key lever **18** by a small dimple **48** pressed laterally from the slide member **47** and also by a short longitudinal extending plateau **49** likewise pressed laterally from the slide member **47**. The dimple **48** and plateau **49** minimizes the frictional engagement between the slide member **47** and its associated key lever **18**. The slide member **47** is pivotally supported on the rod **21** which is received in elongated slot **51** of each slide member **47** to permit a limited amount of longitudinal movement of the slide member **47**. While the rod **21** could support and guide the rear end of each slide member **47** in its longitudinal movement, the sides of the slide member slot **51** would in such case preferably need to be polished to minimize the frictional forces involved. In practice, it is preferred to form slot **51** slightly wider than the diameter of the rod **21**. The slide member **47** is provided at its rear end with overturned ear **38** which is engaged by the slightly overturned end of an individual tooth of a comb spring plate **57**, secured to a sloping rear edge of the spacer bar **15** as shown, to provide a bias force urging movement of the slide member **47** in a rearward direction and urging movement. of the rear end if the slide member **47** in a downward direction. The slide member **47** is normally latched against such rearward movement, however, by slide member latch portion **58**, which engages latch roller **59** individual to the slide member **47**. The latch roller **59** is rotatably journaled on a wire **60**.

Upon finger depression of the shift key button **30** pivotally to depress the associated key lever **18**, the pawl actuating projection **45** of the pawl **39** associated with the depressed key lever **18** engages the forward end of the associated slide member **47** and pivots it about the pin **52** while moving it slightly forward to disengage the slide member latch portion **58** from its associated latch roller **59**. Upon latching disengagement of the latch portion **58** and latch roller **59**, an interlock portion **62** of the slide member **47** begins to be inserted between balls **63** of an interlock structure formed by the balls **63** in a manner well known to those skilled in the art and which forms no part of the invention.

As will be evident from the drawing, the latch portion **58** of the slide member **47** has a sharply pointed nose configuration for engagement with its associated latch roller **59**. So long as the apex or nose of the latch portion **58** is above the axis of the roller support wire **60**, the spring bias force exerted by the comb spring plate **57** on the slide member **47** tends to move the latch portion **58** on its associated latch roller **59** upward into fully latched position of the slide member **47**. Thus, if finger pressure on the shift key button **30** in pivoting the slide member **47** in the manner just explained should be released at any time prior to the time when the slide member latch portion **58** is positioned with its nose an incremental distance above the axis of the roller wire **60**, the slide member **47** will restore to fully latched position. As soon as the slide member **47** has been pivoted by finger button pressure sufficiently far that the nose of the latch portion **58** is an incremental distance below the axis of the roller wire **60**, the bias force exerted by the comb spring plate **57** on the slide member **47** will cause the nose of the latch portion **58** to ride down on the now rotating latch roller **59**. The slide member **47** will now begin to move longitudinally to the rear, with the latch portion **58** continuing in engagement with the now rotating latch roller **59**. While this is occurring, the interlock portion **62** of the slide member **47** moves down between and rearwardly through the interlock balls **63** and the rearward longitudinal movement of the slide member **47** continues until halted by engagement of the rod **21** with the forward edge of the slide member slot **51**.

The lower edge of the slide member **47** is provided with coding teeth **69** for generating coded signals in a manner described in the aforesaid Hugh St. Lawrence Dannatt U.S. Pat. No. 3,327,828. By providing one or more coding teeth **69** at preselected ones of the tooth positions on the slide member **47** and by omitting coding teeth from all other tooth positions thereon, the slide member **47** can, by its longitudinal movement, generate a unique code indicative of the desired shifting action and which will identify the upper case or lower case character of subsequently generated codes. The slide member **47** was unlatched for the described movement by manual manipulation of the shift key button **30**.

One coding tooth **69** at a preselected tooth position is provided on all of the slide members including slide members **47** and **47*a*** so that one common code element is generated in response to the unlatched longitudinal motion of any of the slide members such as **47** and **47*a***. This common code element is so controlled that it is generated later and terminated earlier than any of the other code elements generated by the remaining coding teeth **69** of any of the other slide members similar to **47** and **47*a*** of the keyboard. The common code element also initiates a cycle of operation of the associated equipment which utilizes each coded element generated by typical slide members such as **47** and **47*a***. The associated equipment, after progressing through a portion of its cycle of operation, supplies return electrical energization to the keyboard to effect latch restore movement of a latch restore bail 73 The latch restore bail 73 is comprised by a rod **74** arm **75** and drive member **76**. In particular, the latch restore bail 73 is movably pivoted between a rearmost position shown in full lines and a forward position. This is accomplished by mechanical connection of the arm **75** through a rotary solenoid operated actuator **81** as more fully disclosed in the cited Hugh St. Lawrence Dannatt U.S. Pat. No. 3,327,828.

The solenoid actuator **81** is normally maintained energized by the associated equipment to which coded data information is supplied by manual manipulation of the keyboard mechanism including the key shift mechanism. The latch restore bail 73 is thus normally maintained in its rearmost position.

The key shift mechanism includes a rocker arm lever **100** connected between the shift key lever **18** and the unshift key lever **18*a*** at **101** and **102**, respectively. The rocker arm **100** is pivotally mounted on the pivot pin **104** which is rotatable in a bushing **106** fixed to the bracket **108**. The pivot pin **104** is fixed along the length of the rocker arm lever **100** such that the length A of one side of the rocker arm lever **100** is greater than the length B of the other side of the rocker arm lever **100**. In other words, A>B, to compensate for the spring forces in the key shift mechanism generated by the comb spring plate **24**.

The rocker arm lever **100** includes a set of upper and lower tabs **111** and **112** which are coupled to the shift key lever **18** and another set of upper and lower tabs **113** and **114** which are coupled to the unshift key lever **18*a***. It has been found that by having the upper and lower tabs **111**, **112**, **113**, **114** coupled to their respective key levers **18**, **18*a*** a positive camming of the shift key lever **18** and unshift key lever **18*a*** can be achieved. It should be understood, however, that the rocker arm lever **100** can achieve the same results by the use of the upper tabs **111** and **113** only or slots on the ends of the rocker arm lever **100** to receive the shift key lever **18** and the unshift lever **18*a***. The rocker arm lever **100** couples the shift key lever **18** to the unshift key lever **18*a*** in phase opposition or, in other words, the shift key lever **18** is out of phase with the unshift key lever **18*a*** as will be shown hereinafter. For this purpose, a means such as a bail **116** and a spring **117** fastened to base plate **12** urge the shift key lever **18** to a normally unlatched or rest position as shown by FIG. **1** while the unshift key lever **18*a*** is disposed in the down position as shown by FIG. **1**.

The key shift mechanism also includes another shift key lever **18*b*** which is of similar construction to the shift key lever **18** except that the slide mechanism **47** and pawl **39** together with the associated structure is omitted since shift key lever **18*b*** is coupled to shift key lever **18** and bail **116**. The shift key lever **18*b*** includes a button **30*b*** similar to the button **30** of the shift key lever **18**. The shift key lever **18*b*** is pivotally mounted

on the rod 21 and is urged to the up position by the spring 117 in a manner similar to the shift key lever 18.

The sequence of operations of the shift key lever 18 and the unshift key lever 18*a* is more fully described in the copending application of Hugh St. Lawrence Dannatt entitled "Key Shift Mechanism," Ser. No. 579,754, filed Nov. 1, 1967, and assigned to the same assignee as the present application. The shift key lever 18 and the unshift key lever 18*a* are basically the same and operate in the same manner. The shift key lever 18 is shown as being disposed in a normally up position as shown in FIG. 1, while at the same time the unshift key lever 18*a* is shown as being normally disposed in the down position of FIG. 1. The shift key lever 18 and the unshift key lever 18*a* operate in a similar manner to provide a code representing upper case and lower case characters, and figures respectively.

FIG. 1 illustrates the normal latched position of slide member 47 prior to manual pivotal actuation of the shift button 30 and the shift key lever 18, the latter thus engaging the stop bar 23 and the latch portion 58 of the slide member 47 being in full latching engagement with its associated latch roller 59. The latch restore bail 73 is held in its rearmost position at this time by energization of the solenoid actuator 81 as earlier described. At the same time the unshift key lever 18*a* is normally held in the position as shown in FIG. 1.

The shift key lever 18 may be manually depressed sufficiently far that the associated pawl 39 engages and pivots the slide member 47 beneath its point of latched engagement with the associated latch roller 59. The nose of the latch portion 58 of the slide member 47 accordingly is moved below the axis of the roller wire 60, so the that latching engagement can no longer be maintained by reason of the rearward force exerted by an associated finger of the comb spring plate 57 on the slide member 47. Since the slide member 47 is movable downward and longitudinally in a rearward direction, the nose of the latching portion 58 of the slide member 47 continues to engage and rotate the latch roller 59 thus to minimize any frictional forces which may be associated with the unlatching operation and thereby reduce the downward force necessarily exerted on the key lever 18 to effect unlatching of the slide member 47. It may be noted, as illustrated in FIG. 1, that the force exerted by the actuating projection 45 of the pawl 39 on the end of the slide member 47 maintains the pawl 39 substantially nonpivoted on the shift key lever 18 not notwithstanding the bias force exerted by the spring 43 on the pawl 39. The interlock portion 62 of the slide member 47 may be moved between adjacent balls 63 of the interlock structure to prevent similar unlatching of any other slide member including the slide member 47*a* associated with unshift key lever 18*a*. The unshift key lever 18*a* is out of phase with shift key lever 18 but follows the same sequence of operation as the shift key lever 18.

The latch restore bail 73 restores any unlatched slide member such as members 47 or 47*a* to the latched position, the action of slide member 47 will be described and it will be understood that the action of slide member 47*a* could be identically described by substituting the letter *a* after the numbers designating the appropriate elements. As the slide member 47 moves rearwardly to its rearmost position, coding vanes (not shown) are pivoted by the coding teeth 69 against the bias spring force of the code selector contacts (not shown). This bias force tends to pivot the slide member 47 upwardly at its forward end; the upper edge surface of its latch portion 58 accordingly tends to continue to maintain rolling contact with the latch roller 59 and thus minimizes frictional drag on the motion of slide member 47. The rearward motion of the slide member 47 effects a disengagement of its forward end with the pawl actuating projection 45, and the pawl spring 43 thereupon pivots the pawl 39 on the key lever 18 about the forward stud 41 and until the rearmost stud 41 limits the pivotal movement by its engagement with the upper edge of the pawl slot 40.

It will be recalled that a solenoid actuator 81 is deenergized by the associated equipment as the latter initiated a cycle of operation and in response thereto the restore bail 73 is pivotally displaced in a forward direction causing it to engage the downwardly projecting restore portion 90 provided on the lower edge of the slide member 47 so that continued forward motion of the restore bail rod 74 moves the slide member 47 in a forward direction toward its relatchable position with the associated latch roller 59. The slide restore portion 90 has a sloping cam surface 91 which when engaged by the restore bail rod 74 exerts a pivotal upward force on the forward end of the slide member 47 to lift it into latchable engagement with the associated latch roller 59. Here again the continued engagement of the upper flat surface of the latch portion 58 with the latch roller 59 minimizes the frictional forces involved in the slide restore operation. The forward end of the slide member 47 while moving in a forward direction engages the side of the pawl actuating projection 45 and forces the pawl 39 forwardly on the shift key lever 18 against the tension of the spring 43 so that the slide member 47 may move in a forward direction to a fully latched position without engagement of the pawl actuating projection 45 with the upper end surface of the slide member 47. As the latch restore bail 73 continues its forward movement, the restore bail rod 74 begins to ride under the nose of the slide restore portion 90 and thus forcibly moves the forward end of the slide member 47 upwardly toward latching engagement of its latch portion 58 with the latch roller 59. The restored bail rod 74 moves beneath the slide restore portion 90 just after the nose of the latch portion 58 of the slide member 47 is elevated an incremental amount above the axis of the latch roller support wire 60, at which time the sloping edge surface of the latch restore portion 58 lifts the slide member 47 upward to fully latched position on the latch roller 59 by reason of the rearwardly directed force exerted by the comb spring plate 57 (FIG. 1) on the slide member 47. This disengages the slide restore portion 90 and restore bail rod 74 so that the restore bail 73 thereafter completes its forward motion without restraint by any of the latched slide members such as slide member 47. In summary, it should by observed that after depression of shift key button 30 and the consequent depression of shift key lever 18, the slide 47 went through a cycle of motion wherein it was first moved toward the rear of the structure and then restored to the front and a latched position by the action of restore bail rod 74. Thus, the slide member 47 may complete its cycle of motion even though the shift key lever 18 is held in a downward position. Furthermore, in response to the downward motion of the shift key lever 18 the unshift key lever 18*a* at the same time undergoes a complimentary displacement and is now in the up position and is prepared to be depressed by the rocker arm lever 100. In other words, the unshift key lever 18*a* is now is in the same position that the shift key lever 18 was at the start (FIG. 1).

With the shift key lever 18 held in a fully depressed or down position, the slide member 47 may be restored to a fully latched position with its interlock portion 62 out of engagement with the interlock balls 63. While the restore bail rod 74 underlies the restore portion 90 of all slide members such as 47 and 47*a* it thereby locks them against pivotal motion to an unlatched position until the restore bail rod 74 has again moved rearwardly sufficiently far as to no longer underlie the restore portion 90 of any slide members such as 47 or 47*a*. Thus deenergization of the solenoid actuator 81, as by removal of power from the associated data utilizing equipment, causes the restore bail rod 74 to move to its forwardmost position where it locks all slide members such as 47 against motion in response to manual manipulation of their associated key levers (such as 18). The pawl 39 remains longitudinally displaced on the key lever 18 with the pawl actuating projection 45 yet in side abutting relation to the end of the latched slide member 47 so that the latter cannot again be unlatched by the pawl 39 until the key lever 18 is once more restored to its normal uppermost or nonoperated position to

reestablish the overlapping relation between the pawl actuating projection 45 and the end of the slide member 47 as illustrated in FIG. 1. Even though the shift key lever 18 remains so depressed for a prolonged interval, other key levers of the keyboard may be manually depressed to pivot and unlatch their respective associated slide members similar to slide 47 as soon as the restore bail rod 74 has been moved rearwardly by reenergization of the solenoid actuator 81. The unshift key lever 18*a* follows the same operation as that shown for the shift key lever 18 but with an out of phase, or complementary, relationship.

From the operation of the shift key lever 18 and the unshift key lever 18*a*, it may now be seen that the rocker arm lever 100 couples the shift key lever 18 and the unshift key lever 18*a* in phase opposition for upper case and lower case characters, respectively.

In accordance with the invention, the key lock mechanism includes a key lock lever 18*c* which is substantially of the same structure as the key levers 18, 18*a*, except that the key lock lever 18*c* includes a bridging member or tab portion 121 which coacts with the projection 35 of the key shift lever 18 for depressing the shift key lever 18 as a unit. The key lock lever 18*c* is pivotally mounted on the rod 21 and is urged in a clockwise direction by the comb spring plate 24. There exists a first adjustable space between the projection 35 and the tab portion 121. This first space is effectively a built-in time delay for the sequential operation of the key lock lever 18*c* and the shift key lever 18. That is, when the key lock lever 18*c* is operated, the tab portion 121 moves through the space before it coacts with the projection 35. The key lock mechanism also includes a locking member 122 which is pivotally mounted on the key lock lever 18*c* by a pivot pin 124. The locking member 122 is retained laterally by a washer member 125 in a manner well-known to those skilled in the art. The locking member 122 is yieldingly urged in a clockwise direction by a spring 126. The spring 126 is retained at end 129 in an aperture 127 in the key lock lever 18*c* and is retained at the other end by an upturned portion 128 coacting with the locking member 122. The locking member 122 includes a notch portion 130 which coacts with the bar 23 for retaining the key lock member 18*c* in a depressed position which in turn retains the key shift member 18 in a depressed position by the tab 121 acting on the vertical projection 35. The key lock mechanism also includes a bridging member 131 which is fixed to a vertical projection 132 of the key shift lever 18 and includes a portion 133 which coacts with the locking member 122 to retain or urge the locking member 122 in a counterclockwise direction when the key shift lever 18 is depressed. The tab 121 and the bridging member 131 bridge other key levers, such as key lever 9 shown in fragmentary view. This gives added flexibility to the design of the keyboard. The portion 133 of the bridging member 131 is positioned in cooperative relationship with the locking member 122 such that the locking member 122 engages the bar 23 when the key lock lever 18*c* moves at the end of its limit of travel. Another or second space or second clearance exists between the locking member 122 and the portion 133 of the bridging member 131. This second space or second clearance is greater than the adjustable space or clearance between the tab 121 and projection 35 and provides a time delay between the operation of the key lock lever 18*c* and the shift key lever 18. The depression of the shift key lever 18 releases the key lock mechanism. This second clearance or spacing allows the locking member 122 to rotate clockwise to engage the stop bar 23 when the key lock lever 18*c* is depressed. However, when the shift key lever 18 is operated before the key lock lever 18*c*; it closes the second space or second clearance between portion 133 and member 122 and exerts a counterclockwise force on the locking member 122 to retain it in a substantially counterclockwise position to avoid engagement with the bar 23 during its upward travel.

FIGS. 2 and 3 show the locking member 122 in a locked position and in an unlocked position, respectively. It should be noted that when the locking member 122 is in the lock position, the portion 133 of the bridge member 131 is spaced from the locking member 122 by the second clearance which is sufficient for the notch 130 to engage the bar 23. Referring to FIG. 3, the locking member 122 includes a tab portion 137 which coacts with the key shift lever 18 for depressing the key lock lever 18*c* when a force is exerted on the locking member 122 by the portion 133 of the bridging member 131.

In the operation of the key lock mechanism, the shift key lever 18 may be locked in a shift position by the depression of the lock button 134. When the lock button 134 is depressed, the tab portion 121 moves through the small clearance between the vertical projection 35 and the tab portion 121 to effect a short time delay during which the space between the portion 133 and the locking member 122 increases. This may be seen by observing the position of the pin 124 on the key lock lever 18 as it is depressed. Since this distance is increased and the locking member 122 is biased in a clockwise direction, the notch 130 engages the stop bar 23 locking the key lock lever 18*c* and the shift key lever 18 in the shifted position. During this shift operation, the shift key lever 18 and the unshift key lever 18*a* together with their associated slide members 47, 47*a* operate in the manner set forth hereinbefore. When it is desired to unlock the shift key lever 18, the shift key button 30 is depressed so that the bridging member 131 and the portion 133 rotate the locking member 122 in a counterclockwise direction to disengage the notch 130 from the stop bar 23. The comb spring plate 24 continuously urges the key lock lever 18*c* in an upward direction. Thus, the pivot pin 124 is also moved in an upward direction to decrease the gap or space between the portion 133 and the locking member 122 to a point at which it contacts the portion 133. This in turn urges the locking member 122 in a counterclockwise direction to keep the notch 130 away from the stop bar 23 and thus permits the shift key lever 18 to return to the unshifted position as previously described.

From the foregoing description, it may be seen that the key lock mechanism provides for the positioning of additional key levers between the key lock lever 18*c* and the shift key lever 18. Thus, greater variety in the arrangement of the keyboard can be achieved by the utilization of the present invention.

While there has been described a specific form of the invention for purposes of illustration, it is contemplated that numerous changes may be made without departing from the spirit of the invention.

I claim:

1. A key lock mechanism for a keyboard having a plurality of key levers including a shift key lever which is movable between a normally unshifted position and a shifted position, said key lock mechanism comprising:

a. a key lock lever mounted in spaced relationship to said shift key lever for movement between corresponding normally unshifted and shifted positions;

b. a fixed bar;

c. locking means including a spring biased locking member pivotally mounted on said key lock lever for latching said key lock lever in said corresponding shifted position when moved thereto;

d. a first bridging means mounted on said key lock lever and coupled to said shift key lever for urging said shift key lever to said shifted position; and

e. second bridging means mounted on said shift key lever and coupled to said locking member for decoupling said locking member from said fixed bar when said shift key lever is shifted before said key lock lever.

2. The invention defined in claim 1 wherein said key lock lever is spaced from said shift key lever by at least one key lever.

3. The invention defined in claim 1 wherein said key lock lever is spaced from said shift key lever by at least one key lever and said first and second bridging means span said one key lever.

4. The invention defined in claim 1 further including a lock button on said key lock lever for operating said key lock lever.

5. The invention defined in claim 1 wherein said first bridging means includes a substantially horizontal tab portion and said shift key lever being responsive to the displacement of said tab portion.

6. The invention defined in claim 1 wherein said locking member is pivotally disposed on a pivot pin fixed to said key lock lever.