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Madison

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[54] **TYPEWRITER CARRIAGE JAM PRECLUDING AND ACTION JAM RELEASE MECHANISMS**

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[73] Assignee: **Litton Business Systems, Inc.**, New York, N.Y.

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[52] **U.S. Cl.** **197/176**; 197/179; 197/91; 197/65

[51] **Int. Cl.** **B41j 25/18**

[58] **Field of Search** 197/178, 176, 177, 179, 197/63, 64, 92, 94, 96

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Primary Examiner—Edgar S. Burr
Assistant Examiner—R. T. Rader
Attorney, Agent, or Firm—Joseph R. Spalla, Esq.

[57] **ABSTRACT**

A typewriter is provided with carriage control mechanisms such that more than one carriage control function can be initiated at one time. The arrangement of carriage function controls permit a dominant carriage movement to prevail, and less dominant carriage movement function controls will either give way or, in case of tabulation, give way and await completion of the dominant function while yet remaining in active position to arrest tabulating movement. No interlocking of carriage functions is necessary. More particularly, if a dominant carriage return is initiated, carriage return movement of the carriage will cause a backspace pawl, controlled by initiation of a backspace function, either immediately before or after carriage return movement begins, to move out of engagement from the escapement rack. If either a carriage or backspace function is in progress, i.e., the carriage is moving to effect a carriage return or backspace, a tabulation function can still be initiated. If however, a set tab stop on the carriage, during movement of the carriage in return or backspace direction, encounters the tabular stop blade placed and latched in readiness to arrest a set tab stop during tabulation movement, it will cause the tab blade to be rocked out of the way yet remain latched whereby, on completion of carriage return movement, tabulation movement will begin and the first set tab stop encountered will be arrested by the positioned tab blade to terminate tabulating movement. Also provided is a tab set blade which, if operated during any carriage movement as would jam the carriage, will give way on encounter with set tab stops. Other features of the invention reside in a novel carriage construction, power roll construction, and power roll jam release controls.

4 Claims, 11 Drawing Figures

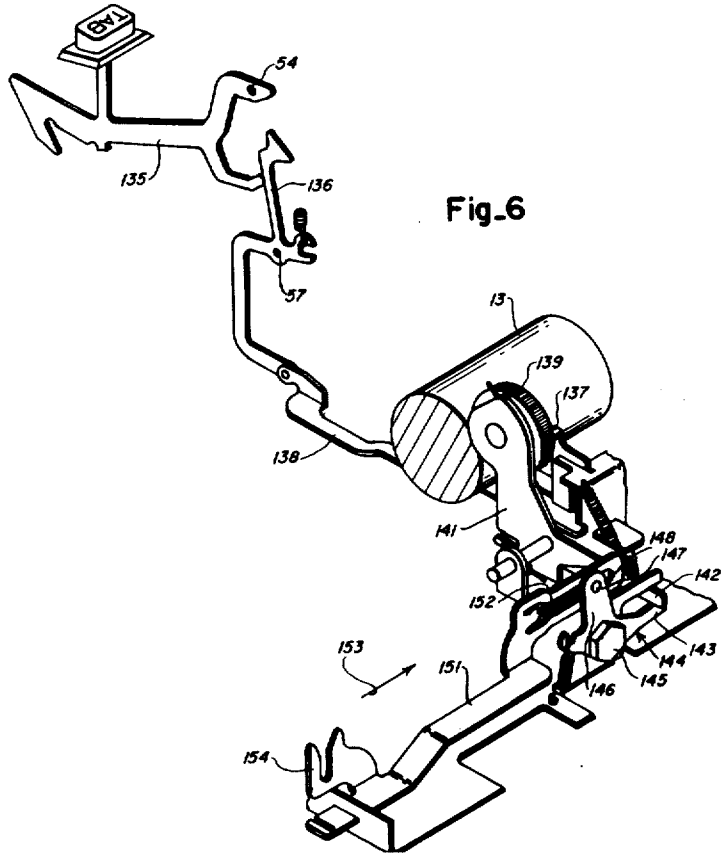

Fig_6

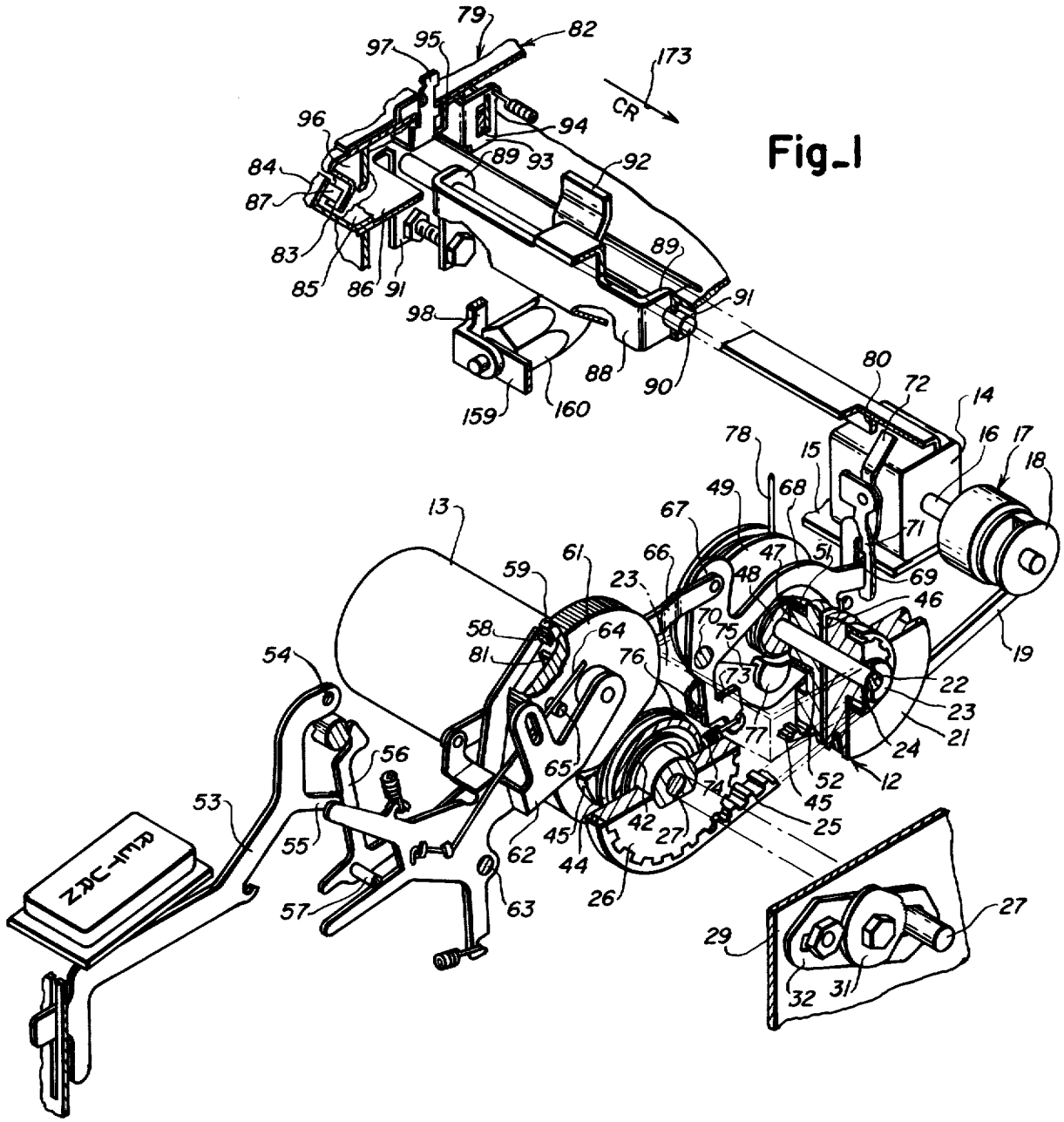
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Fig_1

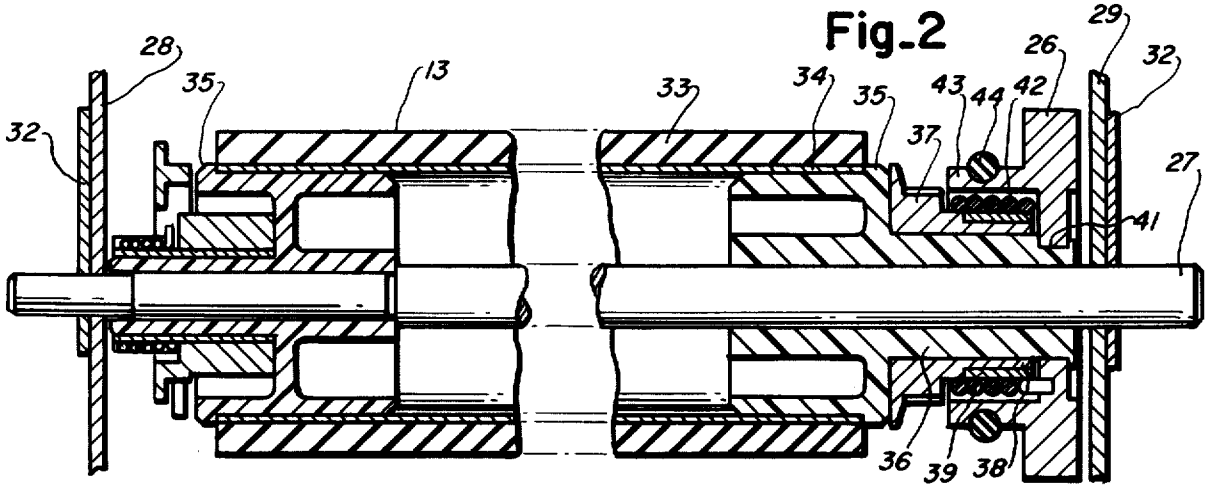
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Fig_2

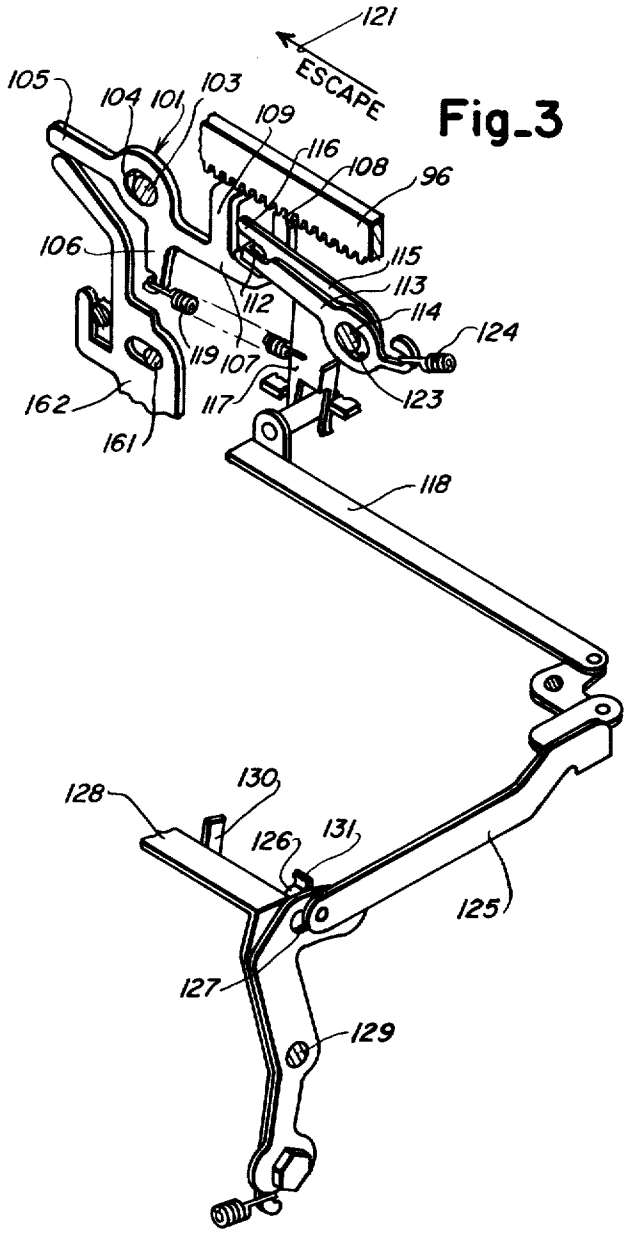

Fig_3

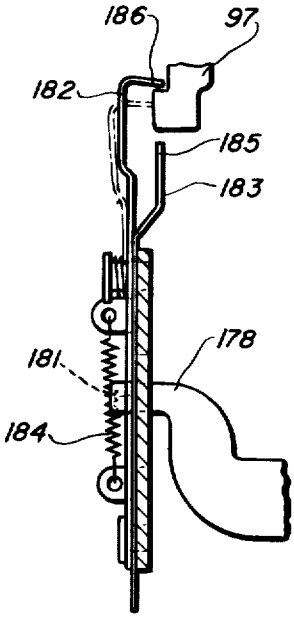

Fig_8

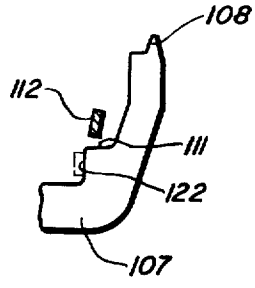

Fig_4

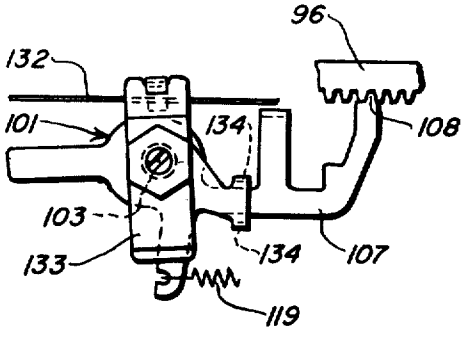

Fig_5

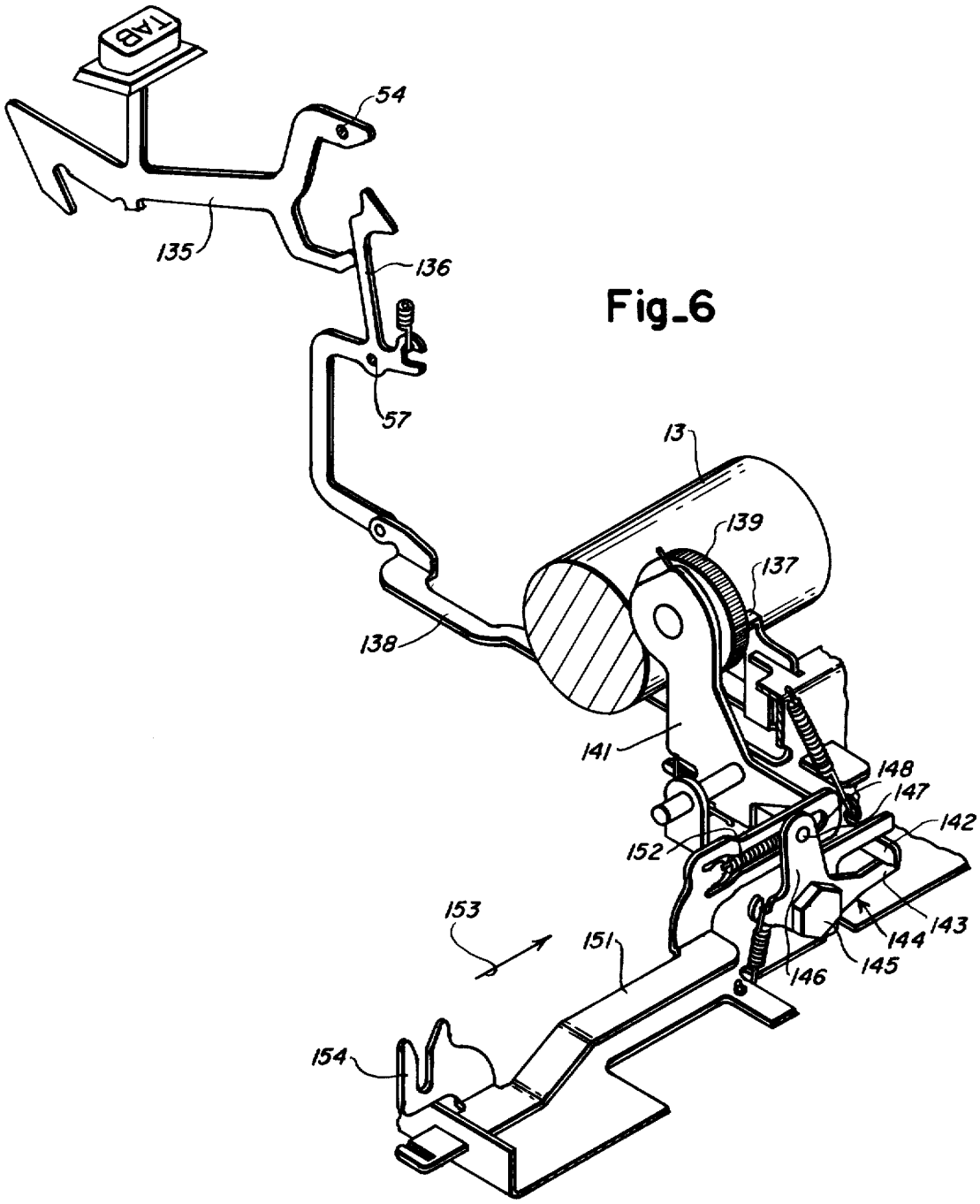
TAB
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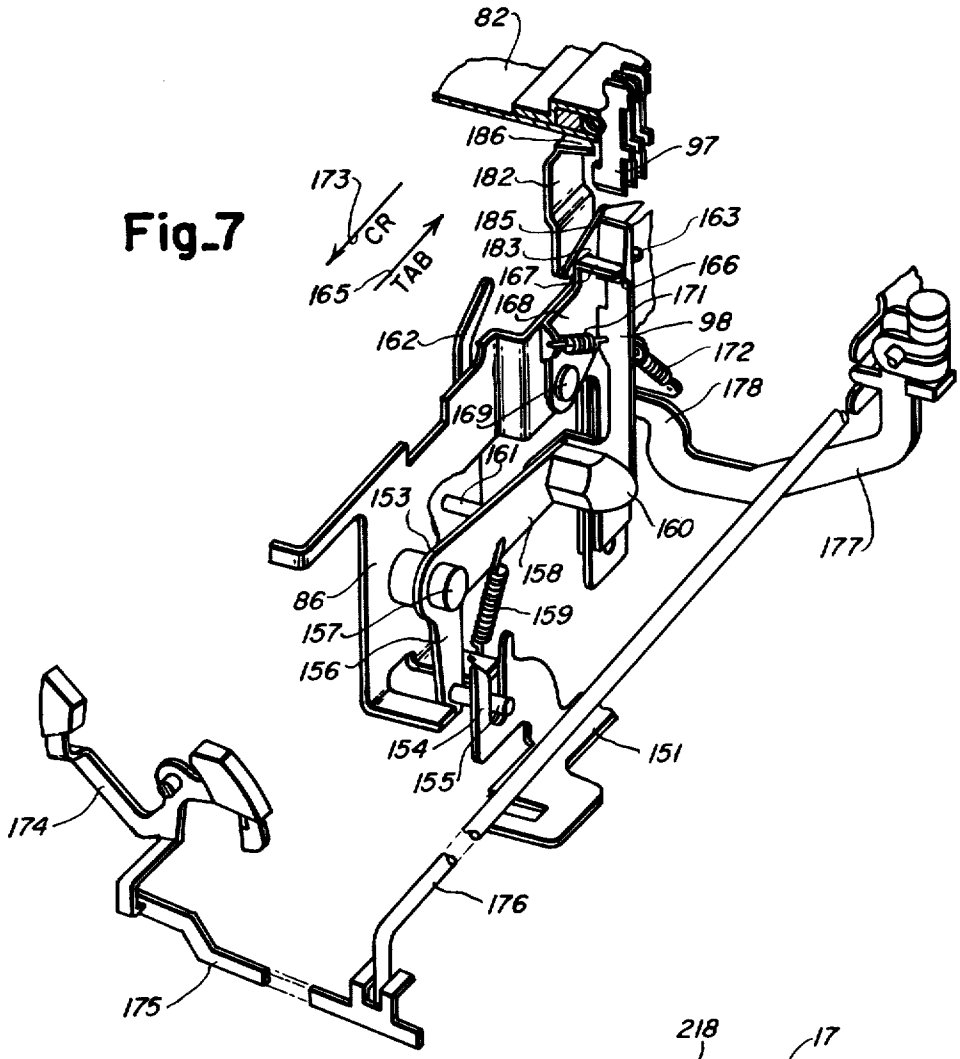
Fig_6

Fig_7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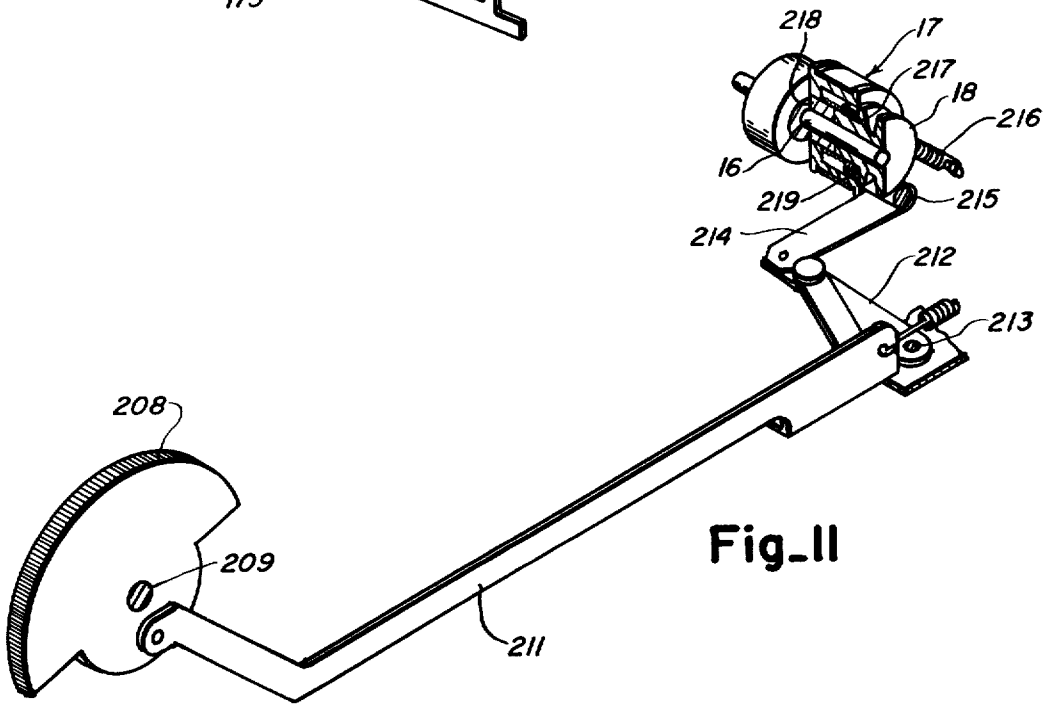
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Fig_11

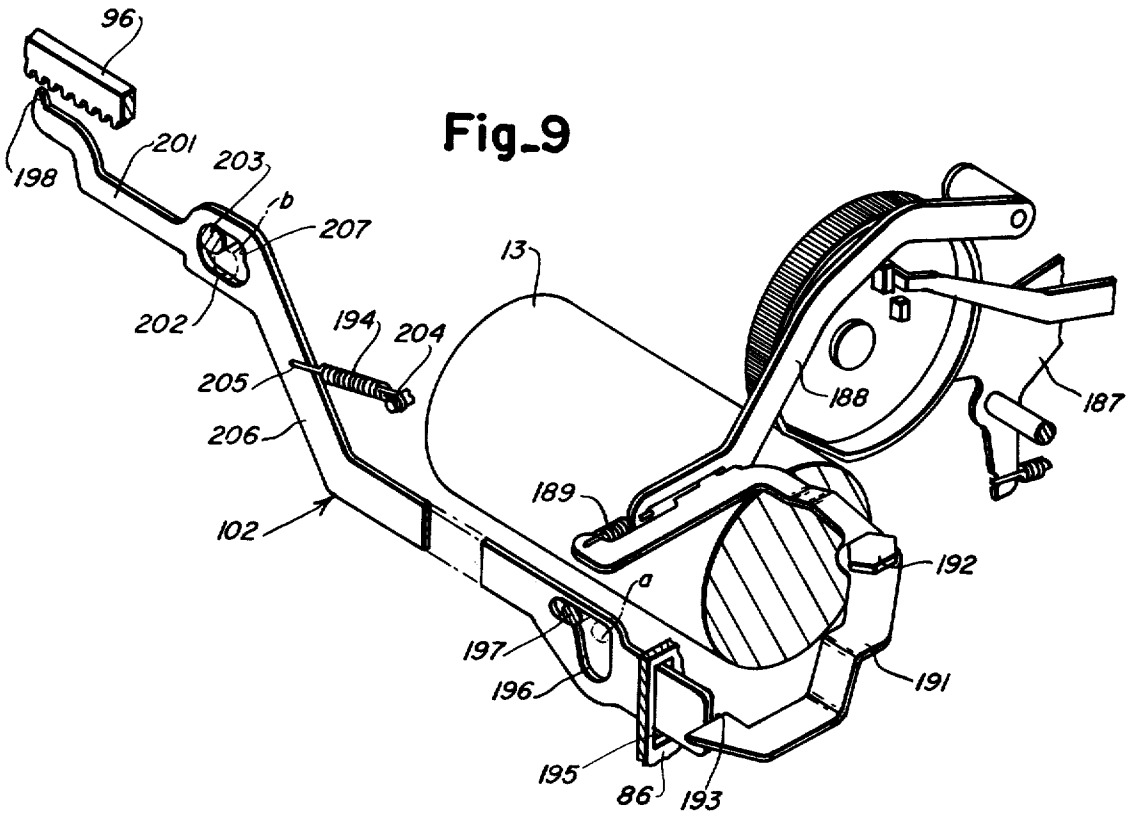
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Fig_9

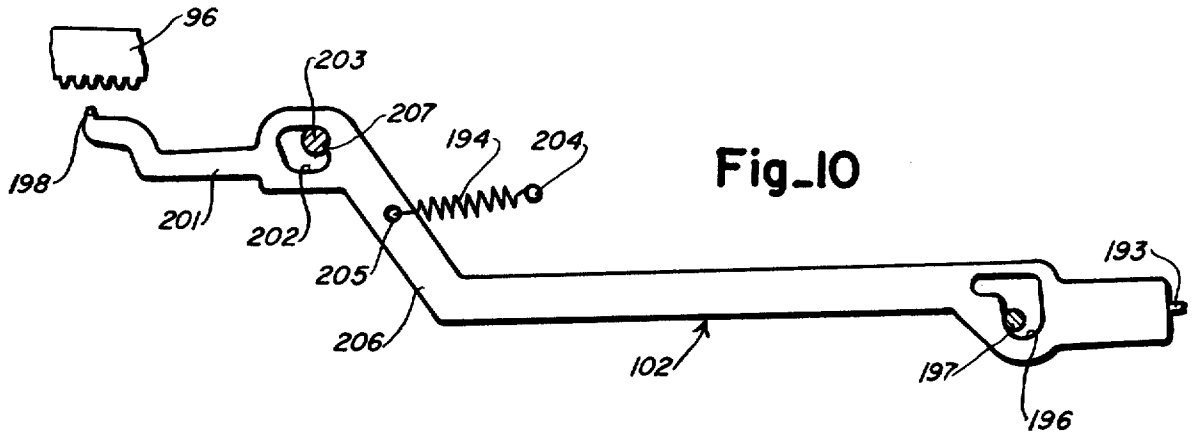
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Fig_10

TYPEWRITER CARRIAGE JAM PRECLUDING AND ACTION JAM RELEASE MECHANISMS

BACKGROUND OF THE INVENTION

This invention relates to electrically powered typewriters and particularly jam precluding carriage function control mechanism. Typewriters having electrically powered carriage functions have usually provided interlock mechanisms which are operative to block initiation of a second carriage function while an earlier called function is in progress to avoid jams and damage to machine parts. Such interlock mechanisms add undue complexity to a machine and are expensive in terms of cost, assembly and adjustment.

SUMMARY OF THE INVENTION

This invention relates to jam precluding typewriter carriage tabulating, backspace, escapement, and carriage return mechanisms. More particularly, it relates to typewriter carriage control mechanisms having by-pass structures which give way after they have been actuated, to a more dominant or more highly powered carriage movement initiated contemporaneously; and, specifically, it relates to the interrelationship of these carriage function mechanisms wherein less dominant or lower power requirement functions give precedence to more dominant carriage movements.

Accordingly, an object of the invention is to provide jam free typewriter carriage control mechanisms wherein dominant carriage movements take precedence over other carriage movements.

Another object of the invention is in the provision of jam free typewriter carriage controls which are not interlocked and may be called contemporaneously with the dominant or strongest carriage movement prevailing.

Another object of the invention is in the provision of typewriter tabulation mechanism including a tab blade which after being actively positioned and latched can be displaced from active position or by-passed by a tab stop during either carriage return or backspace movement while yet remaining in latched active position for operation after termination of carriage return or backspace movement.

Another object of the invention is to provide a simple operator controlled power roll jam release structure.

Still another object of the invention is in the provision of a compact, light and balanced carriage to minimize twisting moments of the carriage incident to initiation and termination of carriage movements.

A further object of the invention is to provide for easily manufactured and assembled and easily removable power roll construction.

Still other objects, features and advantages of the present invention will become apparent to those skilled in the art from a reading of the following detailed description of a preferred embodiment, taken in conjunction with the accompanying drawing wherein like reference numerals designate like or corresponding parts throughout the several views and wherein.

IN THE DRAWING

FIG. 1 is a perspective view of a power train and carriage return control mechanism with associated carriage and frame parts;

FIG. 2 is a sectional view showing the power roll construction;

FIG. 3 is a perspective view of an escapement mechanism;

FIG. 4 is a partially schematic view showing the escapement pawl and associated by-pass slide in normal and by-passed relationships;

FIG. 5 is an elevational view showing escapement control mechanism to provide slient carriage return movement;

FIG. 6 is a perspective view of powered tabulating control mechanism;

FIG. 7 is a perspective view of tabulating stop blade and associated control structure;

FIG. 8 is an elevational view showing details of the tab set and clear control structure;

FIG. 9 is a perspective view showing backspace mechanism;

FIG. 10 is an elevational view illustrating backspace operation and by-pass relationships; and

FIG. 11 is a perspective view showing power roll jam release mechanism.

DESCRIPTION OF THE INVENTION

Referring now to the drawing wherein like reference numerals designate like or corresponding parts throughout the several views, there is shown in FIG. 1 a power train in the form of a speed reduction drive generally designated by reference numeral **12**, which continuously drives a power roll **13** of a typewriter which upon engagement by cams of type actions drives the type actions and machine function mechanisms of the typewriter. The power train includes a motor **14** mounted on a base frame **15** whose output shaft **16** is connected through a normally engaged wrap spring reset clutch assembly generally designated by reference numeral **17** to a motor pulley **18.**

The motor pulley **18** is connected by a V-belt **19** to a forward located intermediate **21** rotatably mounted on a shaft **22** secured to a side frame supported bracket **23.** Pulley **21** is integral with a smaller intermediate toothed pulley **24** on its outboard side which is connected by a toothed belt **25** to a toothed power roll drive pulley **26** rotatably mounted on a power roll support shaft **27** which is adjustably secured to the left and right side frames **28** and **29** by means of rotatably adjustable tooth eccentrics **31** secured to slotted adjusting plates **32,** which are in turn secured to the machine side frames **28** and **29.**

Known prior art power rolls are assembled as a unit including a center shaft which is supported for rotation in frame mounted bearings. After assembly of such a power roll the periphery is usually ground to make it concentric with the center shaft.

In accordance with this invention, power roll bearings are assembled with the power roll and the power roll periphery can be ground concentric with the bearings insuring greater accuracy. Another feature of the invention is the easy assembly, mounting, and disassembly of the shaft **27** which supports the power roll. The shaft **27** is adjustably fixed to the frame as noted but when loosened can be pushed through the power roll bearings to facilitate removal of the power roll.

With reference to FIG. **2,** the power roll **13** comprises an outer rubber cover sleeve **33** supported on an inner core sleeve **34.** Plastic bearings **35** which are supported on the shaft **27** which extends therethrough, are press fitted into the ends of the core sleeve **34.** The bearing **35** in the right end as viewed in FIG. **2** has an

outwardly extending hub **36** which rotatably supports a toothed carriage return drive pulley **37** which itself has a rightward extending hub **38** around which is secured a metal sleeve **39.** The power roll pulley **26** is keyed as at **41** to the end of the bearing hub **36** thereby to drive the bearing **35** and the power roll **13.** A torque limiter spring **42** is tightly wrapped about the metal sleeve **39** and has one end secured to the power roll pulley **26** whereby the carriage return pulley is normally frictionally driven. On initiation of a carriage return, the spring **42** will slip whereby the load of the carriage is assumed smoothly. The power roll pulley **26** is further provided with a hub **43** extending inwardly over the torque limiter spring which supports an O-ring **44** which serves to drive a carriage return roll cam.

With reference to FIG. **1,** the carriage return drive pulley **37** is connected by a toothed belt **45** to a larger second carriage return drive pulley **46** rotatably mounted on shaft **22** inward of the intermediate drive pulley **21.** The carriage return drive pulley **46** is provided with an inward extending hub **47** coaxial with an outward extending hub **48** of a carriage return drawband pulley **49.** Wrapped about both hubs **47** and **48** is a normally open clutch wrap spring **51** having one end **52** connected to the carriage return drive pulley **46.** The spring constitutes a carriage return clutch.

As viewed in FIG. **1,** a carriage return keylever **53** is pivotally supported on a bracket supported transverse fulcrum rod **54,** which also pivotally supports the other keylevers of the typewriter keyboard. Depression of the carriage return keylever **53** causes a finger **55** thereon to push against and rock clockwise a trip lever **56** pivotally supported, as are all other action trip levers, on another bracket supported transverse fulcrum rod **57.** A bent off end **58** of a rearward extension of the trip lever **56** is normally positioned in the path of a primary stop **59** on a carriage return roll cam **61,** which is mounted on a sublever **62** that is also pivotally supported, as are all other action sublevers, on another bracket supported fulcrum rod **63.** Depression of the carriage return keylever **53** rocks the trip lever **56** clockwise as viewed in FIG. **1** with the result that its end **58** moves away from and releases the primary stop **59** to thereby allow a rod spring **64** on the sublever to act against an abutment **65** on the side of the cam opposite primary stop to rock the cam **61** into engagement with the O-ring **44.** The eccentrically mounted cam **61,** as it is driven, rocks the sublever **62** counter-clockwise pulling a link **66** forwardly. The rear end of the link **66** is connected to a crank **67,** which is pivoted on a shaft **70** secured to the machine side frame supported bracket **23.** The crank **67** has a first rearwardly extending arm **68** which extends above and beyond the clutch spring **51** into a vertically extending slot **69** of a bracket **71.** The bracket **71** pivotally supports a carriage return clutch latch **72** biased in a counter-clockwise direction toward the slot **69.** A second depending arm **73** of the crank has a spring **74** connected thereto and to a frame anchor (not shown). Another lever **75** pivoted on shaft **70** has an offset tail **76** abutting the rear of arm **73.** Lever **75** extends rearwardly and its rear end is connected by a spring (not shown) which is anchored on the frame to thereby bias lever **75** counter-clockwise. Lever **75** also has a friction shoe **77** attached thereto positioned below the carriage return clutch spring **51.** Thus, as crank **67** is rocked, the end of arm **68** moves upwardly and is latched by the carriage return latch **72.** Simultaneously, because arm **73** moves, lever **75** normally blocked thereby is spring urged upward and the friction shoe **77** is allowed to engage the wrap spring **51** causing it to wrap and couple the carriage return pulley **46** to the drawband pulley **49,** which winds the carriage return drawband **78** and moves the carriage, generally designated by reference numerals **79,** to which it is connected, to the right as viewed in FIG. **1** until an abutment **80** on the carriage hits the latch **72** releasing the crank arm **68** for return to normal position which retracts lever **75** thereby releasing the clutch spring **51.** As the carriage return cam **61** rotates, it brings a secondary stop **81** around into contact with the end **58** of the rocked trip lever arresting the cam **61** if the carriage return key is still depressed. On release of the carriage return key **53** the end **58** of the trip lever will be moved up to again engage the primary stop **59** on the cam.

The carriage **79** as viewed in FIG. **1** has a transverse carriage beam generally designated **82** whose edges form rails **83** shaped complementary to rails **84** of a transverse carriage supporting beam **85** supported on a machine frame supported compound bracket **86** between which rails are roller elements **87.** Mounted on the bracket **86** is a center stop structure **88.** More particularly, the center stop structure **88** has rearwardly extending arms **89** secured to a bracket supported shaft **90.** The lower rail defining machine frame supported bracket **86** also has downwardly extending arms **91,** which pivotally support the shaft **90** outwardly of the center stop structure support arms **89** yet allow movement of the center stop structure a limited distance to the left from the normal position shqwn which movement is used to provide line locking as more particularly shown in an application of Theodore N. Madison Ser. No. 333,295 filed of even date with this application titled Type Action Arrangement now U.S. Pat. No. 3,838,762. A center stop **92** normally extends upwardly and lies in the path of margin stops **93** settable along the margin rack **94.**

A salient feature of the invention resides in that the carriage beam **82** supports on its underside the margin rack **94,** the tab rack **95,** and the escapement rack **96.** This arrangement reduces the moment arms tending to rotate the carriage about a vertical axis whenever the carriage **79** is arrested as when a margin stop **93** encounters the center stop **92** or a set tab stop **97** encounters a positioned set tab blade **98** (FIG. **7**) or when an escapement pawl **101** (FIG. **3**) or a backspace pawl **102** (FIG. **9**) engages the escapement rack **96.** This balanced construction reduces tendency to bind and jam and permits the carriage frame to be made from light sheet metal lessening its weight. The low mass balanced carriage construction permits the elimination of carriage arresting dash pots yet allows the carriage to be fully returned to the left margin and placed again under control of the escapement with even margin assured.

Cooperating with the escapement rack **96,** as shown with reference to FIG. **3,** is an escapement mechanism comprising the single pawl **101** pivoted on a stud **103** which extends from the machine frame bracket **86** and into a slot **104** in the pawl **101** of a length allowing an escapement. A tab release arm **105** of the pawl extends leftwardly of the pivot and a pawl return arm **106** extends downward below the pivot stud **103.** An arm **107** extending rightward of the pivot stud is bent rearwardly and upwardly and terminates in a rack engaging teeth **108.** The arm **107** also is formed with an upwardly and

rearward extension 109, which cooperates with a carriage release bail (not shown) to disengage the escapement pawl from the rack 96 as in conventional machines. As viewed in FIG. 4, the upwardly extending toothed arm 107 is provided with a step 111, which is normally in the path of a rearwardly bent end 112 of an escapement by-pass slide 113, which is pivoted on a stud 114 of the machine frame bracket 86. Also mounted on the stud 114 outwardly of the by-pass slide 113 is an escapement trip lever 115 having a leftward extension, the end 116 of which is forked and embraces the bent end 112 of the by-pass slide 113. A downward extending arm 117 of the escapement trip lever 115 is also forked to receive a link 118 operative to the right to rock the trip lever counter-clockwise causing the left forked end 116 to rock the by-pass slide 113, which in turn acts on the step 111 to retract the pawl from the escapement rack 96. A spring 119 is connected between arm 106 of the pawl and the arm 117 of the trip lever which serves to normally bias the pawl into rack engagement and move it relative to the escapement rack 96 a pitch distance permitted by the pawl slot 104 and to reengage the escapement rack. Escapement movement of the carriage in the direction of arrow 121 occurs under control of a conventional spring motor (not shown), as is conventional, and carries with it the released and reengaged pawl to the other limit of the slot 104 to effect an escapement. During this carriage movement, should the trip lever 115 remain in rocked condition, the bent over end 112 of the by-pass slide 113 will be in the path of and will be moved by the vertical portion 122 of the step 111 on the pawl 101 as permitted by a slot 123 on the by-pass slide until the trip lever is restored to normal, at which occurrence a spring 124 connected to the by-pass slide 113 brings it back to a position above step 111. This provides escapement by-pass.

The escapement link 118 is connected via a crank to a link 125 coupled by a pin 126 extending into a slot 127 of a U-bar 128 which is powered in forward direction about pivots 129 in response to movement of a type action sublever 130 or in response to the movement of the sublever 131 of a powered escapement action initiated by space bar operation acting against the pin 126.

As viewed in FIG. 5, a wire 132 extending from end to end of the carriage 79 is frictionally gripped by a lever 133 pivoted on the stud 103 which is rocked during carriage return movement. Fingers 134 thereon embracing the escapement pawl arm 107 acts to disengage the escapement pawl 101 from the rack 96 to provide noisefree carriage return movement.

With reference to FIG. 6, a tabular key lever 135 is pivoted on fulcrum rod 54 and moves a trip lever 136 secured on fulcrum rod 57. The end 137 of a link 138 connected to the trip lever releases the primary stop of a cam 139 mounted on a sublever 141 allowing the cam 139 to engage and be rotated by the power roll 13 and rock the sublever 141 clockwise. A rearward tail 142 of the sublever 141 overlies a horizontally disposed crank arm 143 of a lever 144 pivoted as at 145 on the base frame bracket. The lever 144 has an upward extending arm 146 from which a pin 147 projects forwardly and through a slot 148 in a tab link 151. A spring 152 connects between the pin 147 and the tabular link 151. The action of lever 144 pulls the link 151 in the direction of arrow 153.

As viewed in FIG. 7, the end 154 of the link 151 is forked and embraces a pin 155 extending from the depending arm 156 of the tab blade positioning lever 153 pivoted as at 157 on bracket 86. The arm 158 of the lever extending to the right as viewed in FIG. 7 is connected by a tab blade return spring 159 to the bracket 86 and its end has a center stop control projection 160, which serves to move the center stop 92 out of the path of margin stops 93 during tabulation. The lever arm 158 also has a pin 161 extending therefrom which serves to raise a lever 162 (FIG. 3) mounted on bracket 86 against the arm 105 of the escapement pawl to release the escapement pawl during tabulation. The tabular blade 98 is pivoted on the end of lever arm 158 and extends upwardly, its terminal end serving in combination with a tab abutment 163 on the bracket 86 to engage a set tab stop 97 and arrest tabulating carriage movement indicated to be in the direction of arrow 165. The tab stop blade near its terminal end is provided with an overhanging edge 166 which, when the blade is raised, latches over a finger 167 extending from a latch plate 168. The latch plate 168 is pivoted on a stud 169 extending from bracket 86 and is connected by a spring 171 to the tab blade 98, which serves to maintain tab blade 98 spaced from abutment 163. The latch plate 168 is also connected by a return spring 172 to the bracket 86, and its clockwise movement is limited by an abutment (not shown) on the bracket 86. A tabulating movement of the carriage in the direction of arrow 165 will bring a set tab stop 97 against the positioned and latched tab blade 98, rocking tab blade 98 clockwise about its pivot on lever 158 against the stop abutment 163 and releasing it from the latch finger 167 to allow spring 159 to return the tab blade 98 downward. Should a carriage return or backspace motion in the direction of arrow 173 be initiated while the tab stop blade 98 is positioned and latched, and a set tab stop 97 comes along, the tab blade 98 will be rocked counter-clockwise and carry the latch plate 168 counter-clockwise about its pivot 169 to allow the carriage to continue movement yet retaining the latched relationship. Thus, at the termination of backspace or carriage return motion, tabulating movement will automatically occur and the first set tab stop 97 that comes along will encounter the tab blade 98 moving it against abutment 163 to arrest the carriage 79, unlatching it for return to normal position.

With reference again to FIG. 7, a tab set and clear lever 174 is provided having a common arm 175 linked to rock a bail 176. The bail 176 is secured to a lever 177 whose end 178 extends into slots 181 in a tab clear slide 182 and a tab set slide 183. As viewed in FIG. 8, the set and clear slides 182 and 183 are connected by a spring 184 to return the one or the other to inactive position when the other is moved to action position. The upper end 185 of the tab clear slide 183 is triangularly shaped to cam set tab stops 97 to reset position should the tab clear key be depressed during any carriage movement. Similarly, the tab stop set slide 182 has a triangular end stop 186. Should the tab set slide 182 be activated while any carriage movement is in progress, then the tab set slide 182 will be cammed transversely as illustrated out of the way by any set tab stop 97, and avoid a jam.

A backspace mechanism is shown in FIG. 9. As with carriage return, a backspace keylever depression will trip a backspace action and the rocking movement of

the backspace cam sublever 187 will pull an intermediate link 188. The link 188 is connected by a motion transmitting spring 189 to a bell crank 191 mounted on a vertical pivot as at 192 whose end 193 is held in contact with the single piece backspace pawl 102 by a pawl return spring 194. The backspace pawl 102 is guided in a slot 195 in a frame bracket 86 and is provided with an inverted L-shaped opening 196 adjacent the crank end 193. A pin 197 projecting from bracket 86 extends into the horizontal portion of the opening 196 and serves as a pivot for the backspace pawl 102. The pawl extends to the left as viewed in FIGS. 9 and 10, and is bent upward and then horizontally with the terminal portion bent upwardly and formed as a tooth 198. The last horizontal run 201 of the pawl has a generally trapezoidal opening 202 into which a pin 203 extends. The normal position of the pawl is as viewed in FIG. 9 with the pin 203 in the uppermost left corner of opening 202 and the pin 197 in the farthest part of the horizontal slot of the opening 196. The fixed spring anchor 204 is above the point of connection 205 to the upward run 206 of the pawl and the geometry causes the backspace pawl, when moved by the crank 191, to move initially upward into rack engagement about pin 197, and then horizontally. The pins 197 and 203 supporting the pawl, incident to these pawl movements, assume the relative positions designated *a* and *b* in FIG. 9. Should a carriage return movement be in progress or be initiated, the backspace pawl would be cammed out of and by the escapement rack with the vertical leg of the opening 196 permitting disengagement movement of the pawl as shown in FIG. 10 until restoration of the pawl is permitted by return movement of the crank 191. Throughout carriage return movements or until crank 191 is released, the pawl will be held in disabled active condition shown by means constituting pin 203 and the upper corner notch 207 of the opening 202.

With reference to FIG. 11, a jam reset mechanism is provided to overcome jams causing the motor 14 to stall. Such jams may occur when a number of function keys, such as carriage return, shift, backspace, space bar and tab, are inadvertently depressed when the electrical power supplied to the motor is reduced or when the typewriter is disconnected from a source of electric power. Accordingly, when power is again supplied to the typewriter, the simultaneous engagement of the various typewriter mechanisms may prevent the motor 14 from operating resulting in a jammed condition. As viewed in FIG. 11, a jam release wheel 208 is rotatably mounted on the machine side frame as at 209 and controls a link 211 eccentrically connected to the wheel 208 at one end and at the other end and between the ends of a lever 212. The lever 212 is pivoted about a vertical bracket-supported pivot 213 at one end and to a friction belt 214 at its other end. The friction belt is trained around a shaft 215 to the rear of and below the reset clutch assembly 17 between motor and drive pulley 18, and around the reset clutch assembly with its other end connected to a spring 216 anchored on the machine frame. The clutch, as before noted, comprises a wrap spring 217 which is tight around a hub 218 secured to the motor shaft 16 and has one end secured to the pulley 18 which has an outer sleeve 219 surrounding the wrap spring 217. Tightening the friction belt 214 serves to frictionally rotate sleeve 219 and thus to unwrap the clutch spring 217 sufficiently to break the motor pulley connection as will allow the motor to come up to speed. Rlease of the wheel 208 will again allow the clutch spring to wrap and couple the motor shaft 16 to pulley 18 and deliver to the power roll an impact as will aid to release a jam condition.

Reviewing a dominant carriage return has precedence over all other functions. A carriage return movement always releases the escapement dog, it effects disengagement of the backspace pawl if operated during carriage return movement, it momentarily disables the tabulating and tab set mechanism if initiated contemporaneously with carriage return. Backspace motion, the next in order of dominance also takes precedence over tabulating and tab set function and tabulating takes precedence over tab set.

The invention claimed is:

1. In an electric typewriter having a frame and a carriage movable relative to said frame in carriage return, backspace, escapement and tabulating directions,

escapement means releasably holding said carriage against movement in escapement and tabulating direction,

tabulating control means on said frame and said carriage for releasing said escapement means and for terminating movement of said carriage in tabulating direction,

said tabulating control means including a carriage mounted tab rack having settable stops,

a tab blade,

a tab blade positioning means normally holding said tab blade in a lowered position with its upper end out of the path of set tab stops,

means for operating said tab blade positioning means to raise said tab blade to an active position with its upper end in the path of set tab stops, said tab blade being pivotally mounted at its lower end to said positioning means,

control means responsive to movement of said tab blade positioning means for releasing said escapement means,

pivotally mounted latch means,

means biasing said latch means to a normal position,

means biasing said tab blade toward said normally positioned latch means whereby movement of said tab blade to raised position is guided by said latch means and,

means on said latch means and said tab blade for latching said tab blade in active position incident to movement of said tab blade to active position,

said latched tab blade and said latch means being pivotal about their pivots as a unit out of the path of set stops on encounter of the tab blade by set tab stops during contemporaneously initiated movement of said carriage in a carriage return or backspace direction while maintaining their latched relationship,

said means biasing said latch means returning said latch means to normal position whereby said latched tab blade may terminate tabulating carriage movement following termination of carriage return or backspace movement.

2. In an electric typewriter as recited in claim 1, said tabulating control means comprising keylever operated means including a driven power roll, a sublever, and a roll cam on said sublever releasable into engagement with said power roll to oscillatably drive said sublever, and

means driven by said sublever operative to move said tab blade positioning means.

3. In an electric typewriter as recited in claim 1, said tabulating control means including a tab set key,

a tab set slide having a finger movable from a position out of the path of set stops to a stop set position thereby to engage and move a tab stop positioned in its path of movement to set position,

means responsive to movement of said tab set key to move said tab set slide to its stop set position,

means mounting said tab set slide for movement transverse to its normal path of movement to stop set position, and

said finger having edges diverging away from said tab stops responsive to movement of tab stops thereagainst during carriage movements initiated while said slide is in set stop position to move said tab slide in said transverse direction.

4. A typewriter as recited in claim 1, said escapement means including a carriage mounted escapement rack,

a single escapement pawl pivotally and slidably mounted on said frame having a tooth normally releasably engaging said carriage rack to hold said carriage arrested,

means for disengaging said escapement pawl,

a spring connected to move said disengaged escapement pawl one rack tooth distance and to reengage the rack,

said means for disengaging said escapement pawl including a pivotally and slidably mounted by-pass slide normally positioned to engage an abutment on said pawl and operative when pivoted to pivot said pawl out of engagement from said escapement rack,

a pivotally mounted trip arm normally engaging said by-pass slide and pivotal from a rest position to pivot said by-pass slide,

means on said pawl to move said by-pass slide relative to said trip arm until said trip arm returns to rest position,

and further means on said pawl responsive to said control means to pivot said pawl out of engagement with said escapement rack during tabulating movement of said carriage.

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