# United States Patent

[11] 3,598,220



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## [54] RIBBON-LIFTING MECHANISM FOR A TYPEWRITER

**6 Claims, 11 Drawing Figs.**


[52] **U.S. Cl.** ..... **197/156,** 197/157, 197/159

[51] **Int. Cl.** ..... **B41j 35/22,** B41j 33/56

[50] **Field of Search** ..... 197/151, 156, 157, 158, 159



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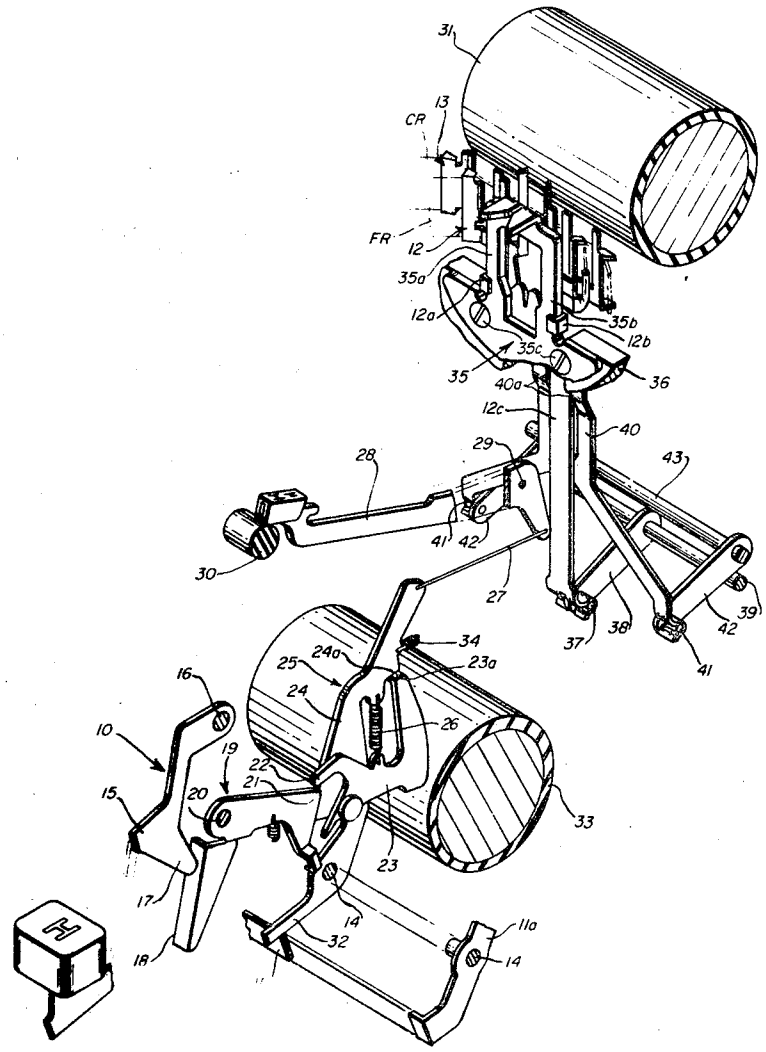
**ABSTRACT:** A ribbon-lifting mechanism for a typewriter comprising a toggle mechanism the common ends of whose links are pivotally mounted on a drive arm, the other end of one link is fulcrumed on a bistable shiftable support, and the other end of the other link is pivotally connected to a ribbon lift crank. The drive arm is operable on each forward stroke to open or straighten and on each rearward stroke to close or break the toggle about its fulcrum. A bistable trip lever also pivotally mounted on the drive arm is conditioned on each forward stroke of the drive arm to shift the position of the bistable support on each rearward stroke of the drive arm, and as a result of the shifting movement of the bistable support a ribbon vibrator connected to the toggle mechanism is elevated alternately through full and partial strokes on succeeding forward strokes of the drive arm whereby in combination with ribbon movement a zigzag pattern is defined on a carbon ribbon to utilize the maximum area of the carbon ribbon.

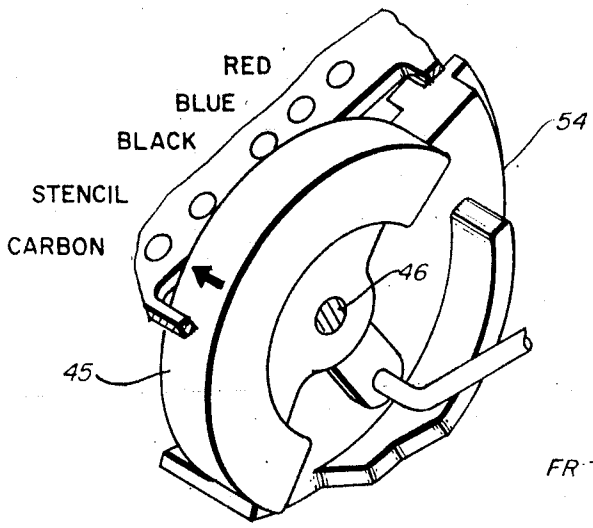



Fig_3

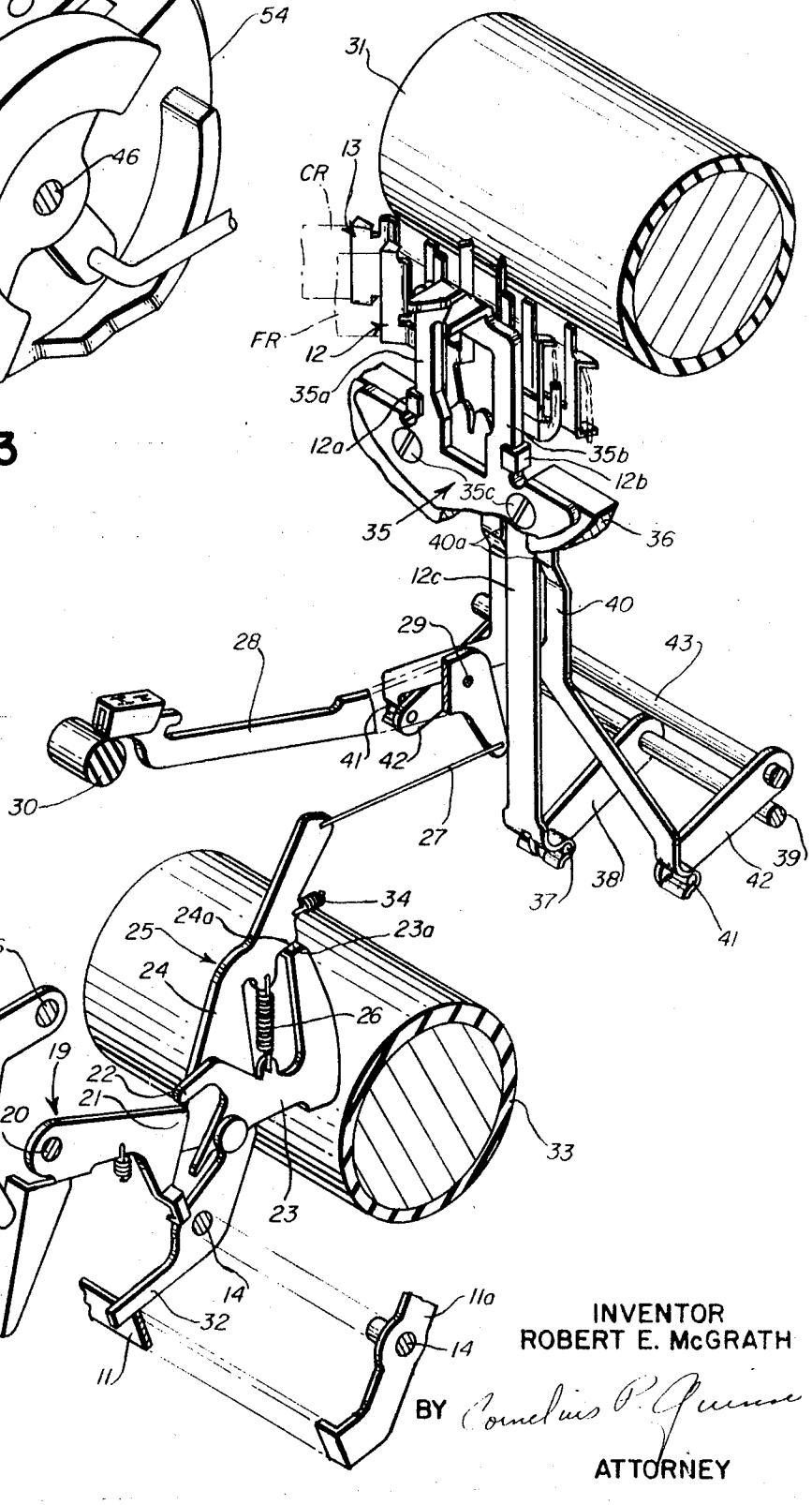



Fig_1

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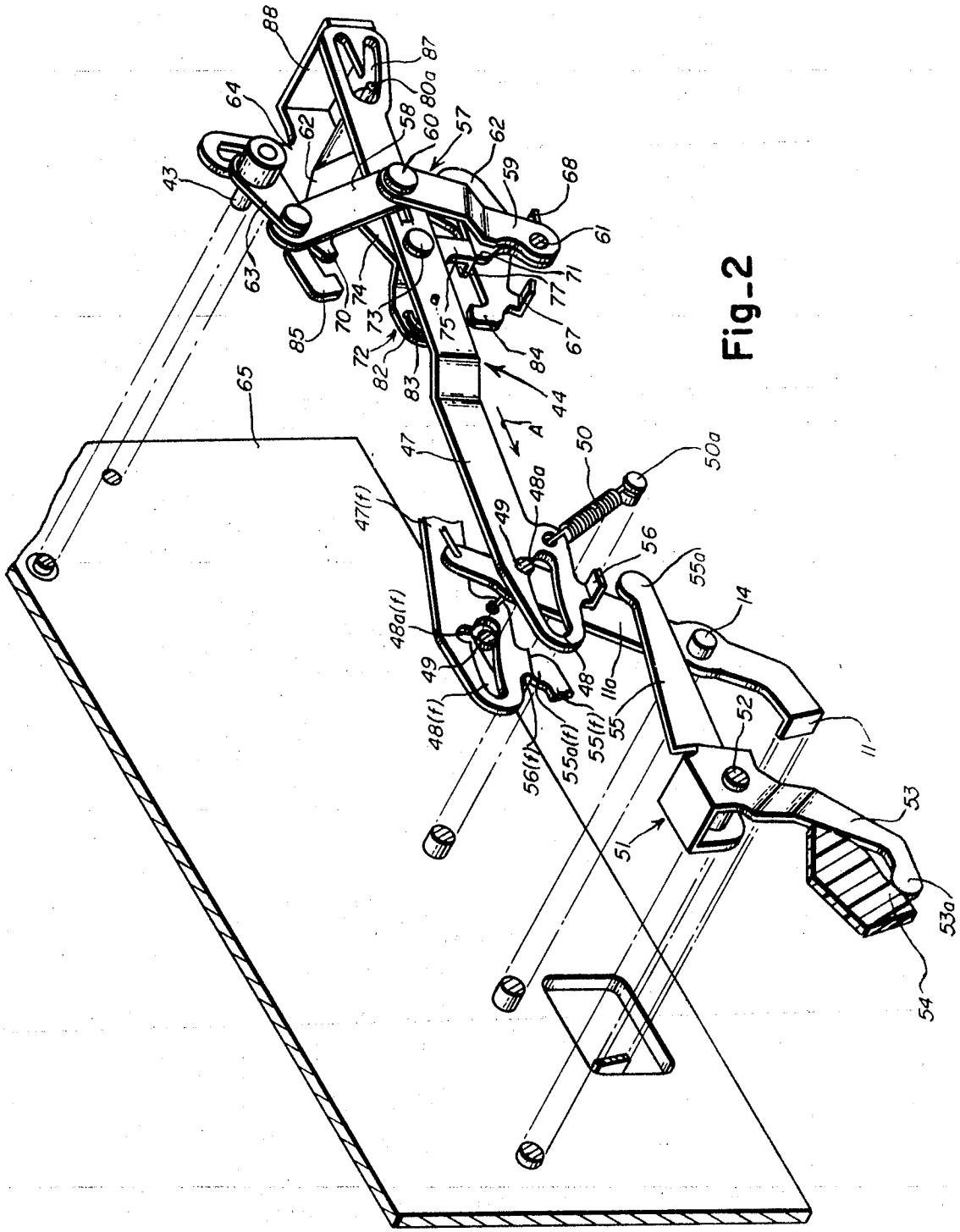


Fig_2

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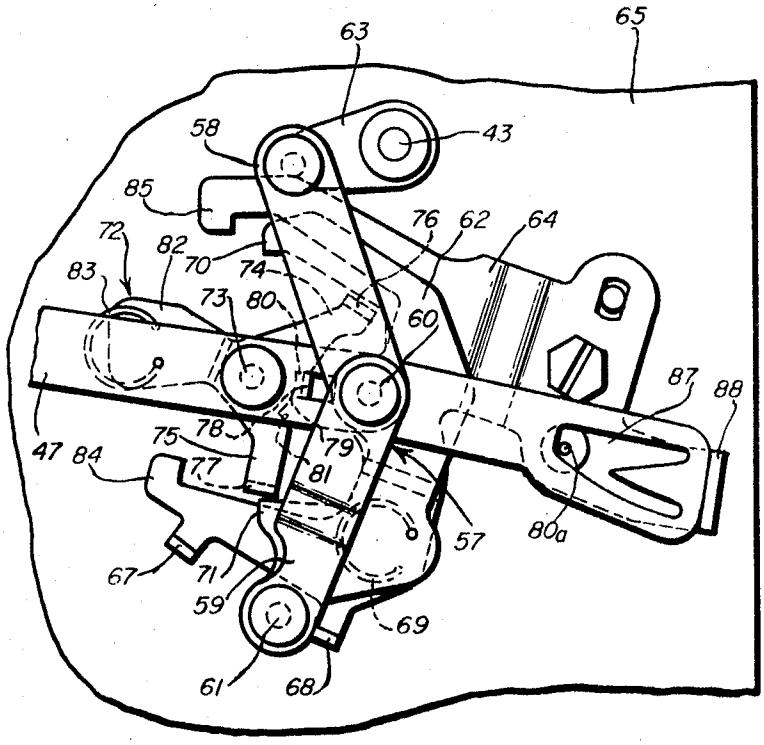
Fig_4



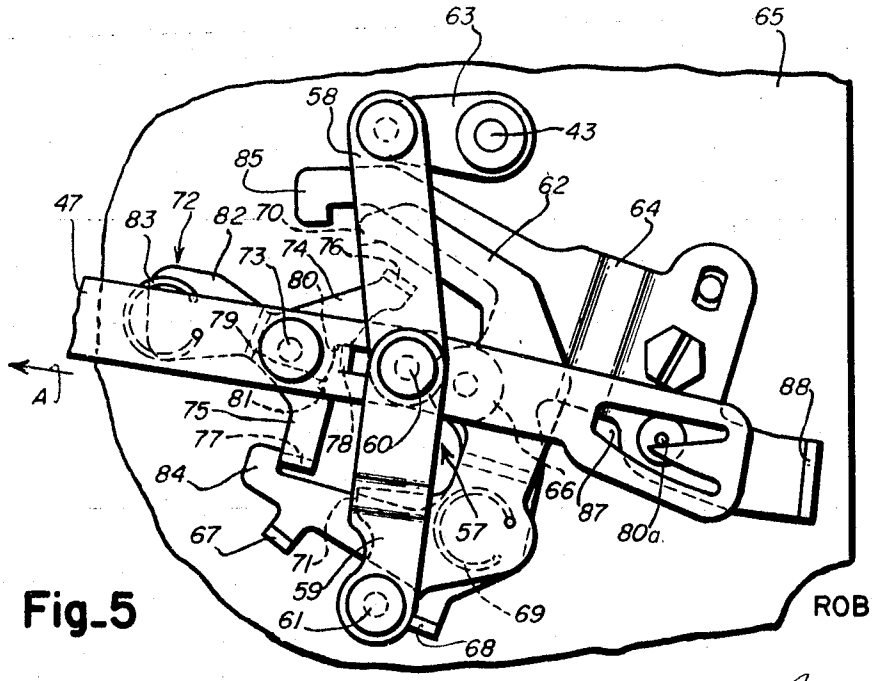




Fig_5

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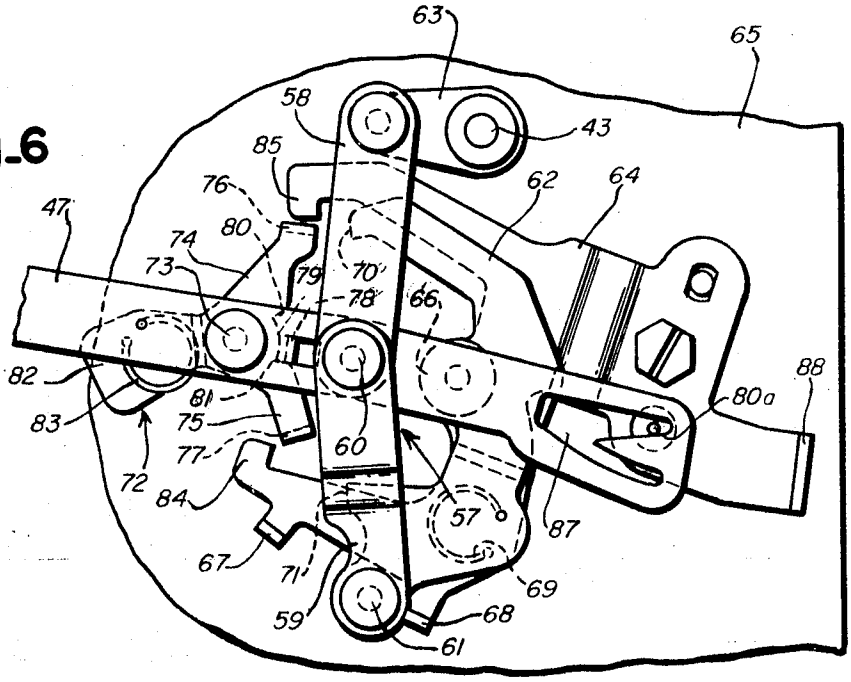
Fig_6



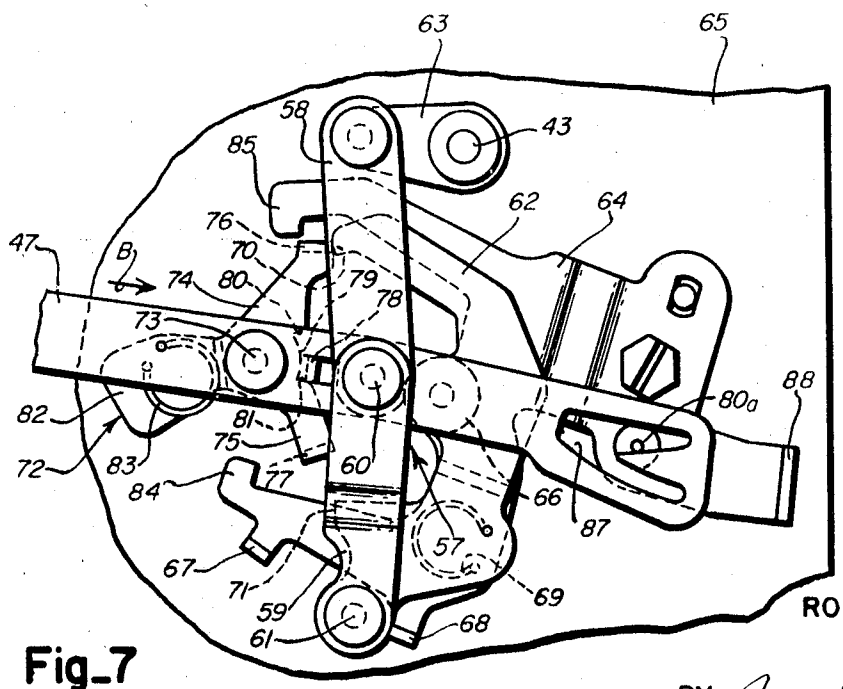




Fig_7

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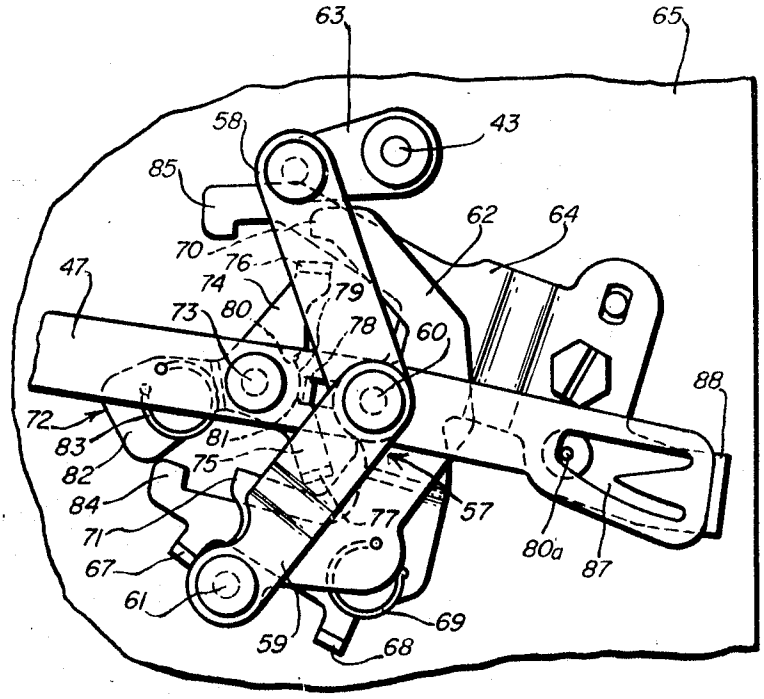
Fig_8



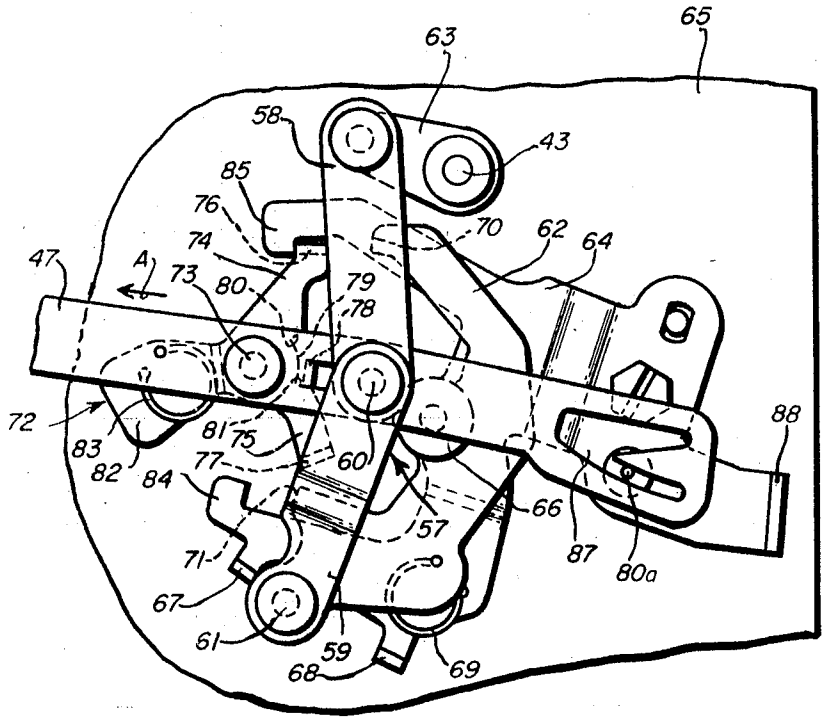




Fig_9

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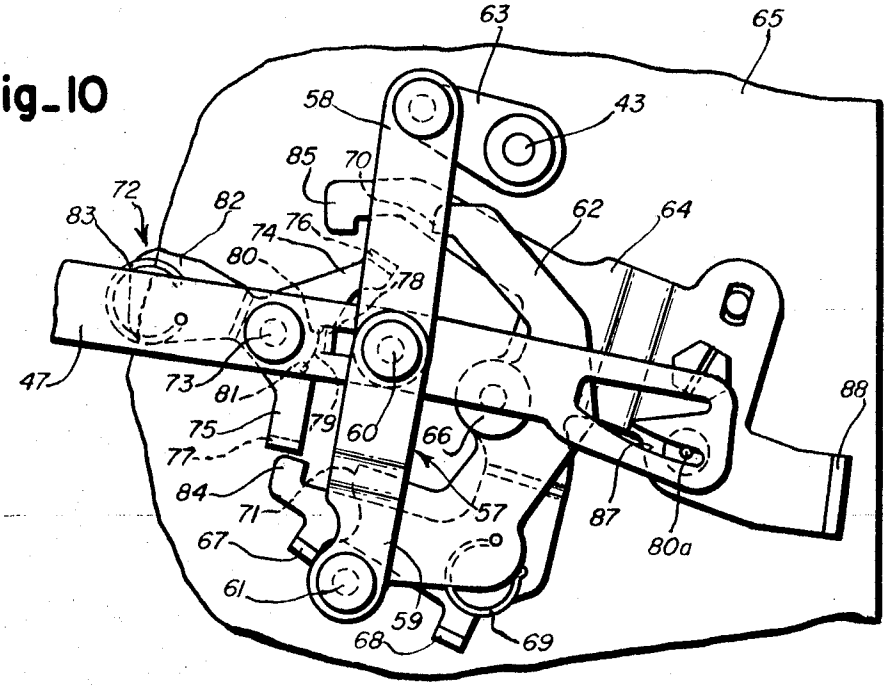
Fig_10



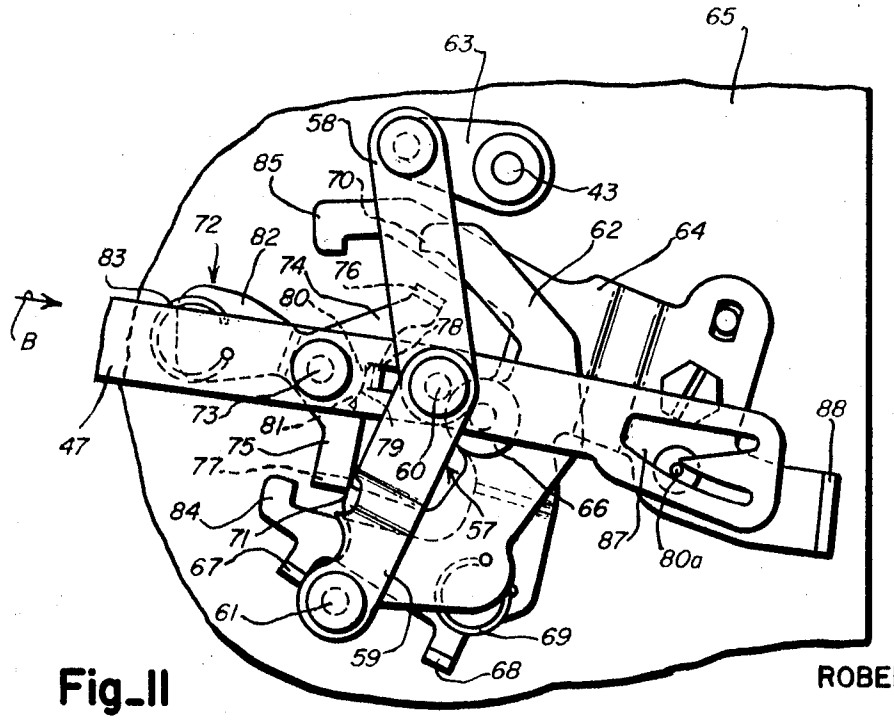




Fig_11

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## DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is particularly directed to a carbon ribbon vibrator for use in a typewriter having the capability of switching between, a fabric ribbon operational mode, a carbon ribbon operational mode and a stencil operational mode, in accordance with the typewriter ribbon selector control apparatus described and claimed in copending U.S. Pat. application Ser. No. 808,516, of Ronald H. McLean filed concurrently on Mar. 19, 1969.

Referring now to the drawing wherein like reference characters designate like or corresponding parts throughout the several views, there is illustrated in FIG. 1 a type action, generally designated by the reference numeral **10**, operable to power a U-bar **11** adapted to selectively drive appropriate ribbon vibrator assemblies for elevating a fabric ribbon vibrator, generally designated by the reference numeral **12**, supporting a fabric ribbon FR and a carbon ribbon vibrator, generally designated by the reference numeral **13**, supporting a carbon ribbon CR.

As illustrated in FIG. **1**, the U-bar **11** moves counterclockwise about a cross-shaft **14** as will hereinafter appear, in response to type action operation initiated by the depression of alphanumeric key levers such as a key lever **15**. The key lever **15** is fulcrumed on a cross-shaft **16** secured to the typewriter frame and is formed with a depending finger **17** engaging the upper surface of a bent off shelf **18** formed on the forward end of a rigid or nonflexible intermediate control lever **19** pivotally mounted on a cross-shaft **20**. An angularly extending rearward portion of lever **19** terminates with a tip **21** that normally underlies the lower edge of a tail **22** formed on a rockable cam **23**. The cam **23** is pivotally mounted on a sublever **24** of an actuating linkage, generally identified by the reference numeral **25**, pivotally mounted on the cross-shaft **14**, and is biased in a counterclockwise direction by a spring **26**. The counterclockwise limit of movement of the cam **23** relative to the sublever **24** is determined by the engagement of a bent-off ear **23***a* on the cam **23** with an adjacent edge **24***a* of sublever **24**. The actuating linkage **25** is articulately connected by a link **27** to a type bar **28** pivotally mounted on a segment wire **29** and is adapted to drive the type bar **28** from a normal position on a headrest **30** into printing contact with a typewriter platen **31**, and at the same time, through a tail **32**, extending from the sublever **24** and overlying the U-bar **11**, move the U-bar **11** counterclockwise.

In operation, the rockable cam **23** is displaced in a clockwise direction in response to the depression of the key lever **15** so as to move into frictional driving engagement with a constantly rotating power roll **33**, thereby initiating a powered printing stroke to the type bar **28** and counterclockwise movement of the U-bar **11**. After typing impact, the type bar **28** and the sublever **24** are returned to their normal positions by means of a return spring **34**, allowing the U-bar **11** to return to a normal clockwise position through the action of a biasing spring (not shown).

The fabric ribbon vibrator **12** and the carbon ribbon vibrator **13** are both positioned behind a type guide generally designated by the reference numeral **35** which is fastened to a shiftable type bar segment **36** by a pair of screws **35***c*. The fabric ribbon vibrator **12** has a pair of bent over ears **12***a* and **12***b* in slidable engagement with the spaced vertical legs **35***a* and **35***b* of the type guide **35** and has a depending leg **12***c* whose lower end is rockably mounted on a stud **37** formed on a lever **38** rigidly mounted on a shaft **39**.

The carbon ribbon vibrator **13** has a leg **40** whose upper end is bent and bifurcated forming a slot **40***a* by which it has guided association with the side edges of the upper portion of the fabric ribbon vibrator leg **12***c*, and whose lower end is formed in a generally inverted U-shape with its ends rockably mounted on studs **41** formed on a pair of levers **42** rigidly mounted on a vibrator elevating rod **43**. Tension in the carbon ribbon, applied by a carbon ribbon drive mechanism (not shown), avoids forward and rearward movement of the carbon ribbon vibrator **13**.

As illustrated in FIG. **2**, a carbon ribbon vibrator drive assembly, generally designated by the reference numeral **44**, is adapted to drive the carbon ribbon vibrator elevating rod **43**, in response to counterclockwise movement of the U-bar **11** occasioned by a type action when a ribbon control selector dial **45**, shown in FIG. **3** and manually rotatable about a cross-shaft **46**, is set to a carbon ribbon operational mode.

The carbon ribbon vibrator drive assembly **44** includes a drive link **47** having an elongated slot **48** in its forward end with an upwardly extending notch **48***a* formed in the rear of the elongated slot **48**. A drive pin **49** extending laterally outward from an upwardly extending arm **11***a* of the U-bar **11** and into the elongated slot **48**, is received in the notch **48***a* when the drive arm **47** is held downwardly by a biasing spring **50** connected between the drive arm **47** and a frame mounted stud **50***a*. With the drive pin **49** in the detent **48***a*, any counterclockwise movement of the U-bar **11** about the cross-shaft **14** will drive the drive arm **47** forward.

The detent **48***a* in the slotted end of the drive arm **47** is adapted to be lifted out of driving engagement with the drive pin **49** by a bellcrank, generally designated by the reference numeral **51**, pivotally mounted on a frame-mounted stud **52**. The bellcrank **51** has a depending cam follower arm **53** with an enlarged end portion **53***a* adapted to follow the surface of a cam **54** formed on the ribbon selector control dial **45** (shown in FIG. **3**), as the ribbon selector control dial **45** is moved between settings, and another arm **55** with an enlarged end portion **55***a* underlying a laterally bent-out ear **56** on the bottom of the forward end of the drive arm **47**. When the ribbon selector control dial **45** is moved from a carbon ribbon operational mode, the cam **54** pivots the bellcrank **51** counterclockwise, as viewed in FIG. **2**, raising the slotted end of the drive arm **47** and the detent **48***a* so that the drive pin **49** is free to reciprocate in the elongated slot **48**.

As illustrated in FIG. **2**, in addition to extending into the elongated slot **48** of the drive link **47** of the carbon ribbon vibrator assembly **44**, the drive pin **49** also extends laterally from the extension **11***a* of the U-bar **11** into an elongated slot **48**(*f*) formed in the forward portion of a drive link **47**(*f*) of a fabric ribbon vibrator drive assembly (the remaining portion of which is not shown). An enlarged end portion **55***a*(*f*) on an arm **55**(*f*) of a bellcrank (not shown) underlies a laterally bent out ear **56**(*f*) on the bottom of the forward end of the drive arm **47**(*f*) to raise and lower the slot **48**(*f*) in relation to the drive pin **49** in order that the drive pin **49** is selectively free to reciprocate in the slot **48**(*f*). A complete description of the operation of the ribbon control selector mechanism and the fabric ribbon vibrator drive assembly is set forth in the hereinabove-mentioned concurrently filed copending patent application of Ronald H. McLean.

During counterclockwise motion of the U-bar **11**, the drive arm **47** is adapted to move forward (as shown by an arrow labeled A in FIG. **2**) under the action of the drive pin **49** and return under the action of the spring **50** when the U-bar **11** returns to its normal position thereby driving a toggle assembly, generally designated by reference numeral **57**, mounted on the drive link to rock the vibrator elevating rod **43** supporting the carbon ribbon vibrator **13**.

The toggle assembly **57** of the carbon ribbon vibrator drive assembly **44** shown in FIG. **2**, and as more clearly illustrated in FIG. **4**, comprises two links **58** and **59** pivotally jointed together by a stud **60** fixed to the drive link **47**. The other end of the toggle link **59** is pivotally carried on a bistable shifting plate or support **62** by a pivot stud **61** for giving the lower end of the link **59** of the toggle assembly **57** one or another support location. The other end of toggle link **58**, is pivotally connected to a ribbon lift crank in the form on an arm **63** fixed to and extending outwardly from the vibrator elevating rod **43**.

As best viewed in FIG. **5**, the shifting plate or support **62** is pivotally mounted on a stud **66** on a frame bracket **64** mounted on a typewriter frame member **65**. The shifting support plate **62** is adapted to shift the end of the toggle link **59** pivoted on the pivot stud **61** back and forth between an upper limit stop **67** and a lower limit stop **68**, both of which limit stop

# RIBBON-LIFTING MECHANISM FOR A TYPEWRITER

## BACKGROUND OF THE INVENTION

This invention relates to a typewriter having the capability of switching between a fabric ribbon operational mode, a carbon ribbon operational mode and a stencil operational mode, and more particularly, to an improved carbon ribbon lift mechanism embodied therein.

While the quality of the copy produced by carbon ribbon is often preferred over fabric ribbon, one of the disadvantages inherent in the use of carbon ribbon in a typewriter has been its high rate of consumption and the resultant inconvenience occasioned by the frequent need to replenish the carbon ribbon supply.

As disclosed in Page U.S. Pat. No. 3,349,888, the consumption of carbon ribbon and the frequency of replenishing the supply of carbon ribbon in a typewriter may be materially reduced by using half inch carbon ribbon, slightly larger than conventional 5/16-inch carbon ribbon, and having the type contact the ½-inch carbon ribbon in a "zigzag" pattern. The "zigzag" pattern is attained by employing a vibrator mechanism in which the vibrator lifting the ribbon is alternately driven through full and partial strokes. On the full stroke the ribbon is raised to a maximum elevation so that the type strikes the lower half of the carbon ribbon, while on the partial stroke the ribbon is positioned so that the type strikes the upper half of the carbon ribbon. After each imprint, while the escapement mechanism of the machine advances the carriage so that the succeeding imprint is properly spaced from the preceding one, the ribbon feed mechanism advances the carriage so that the succeeding imprint is properly spaced from the preceding one, the ribbon feed mechanism advances the ribbon only one-half of a normal escapement space, resulting in a staggered letter character relation on the ribbon. Thus, with a carbon ribbon only slightly wider than a conventional ribbon, the printing capacity and the lift of a spool of carbon ribbon is substantially doubled. Since the cost of ½-inch ribbon is substantially the same as the cost of 5/16-inch ribbon, the economy and convenience attained by this method of printing is apparent.

While the ribbon-lifting mechanism in the hereinabovementioned Page patent for driving a vibrator alternately through full and partial strokes functions very satisfactorily in a matrix-type machine, it is not readily adaptable for use in a type bar machine or in a typewriter possessing the capability of selectively switching between a carbon ribbon mode and a fabric ribbon mode by the mere turning of a selector dial.

## SUMMARY

In accordance with the present invention a selectively operable carbon ribbon vibrator assembly is provided in an electric typewriter. The carbon ribbon vibrator assembly includes a vibrator supporting a carbon ribbon and a toggle mechanism connected thereto pivotally mounted on a drive arm. The toggle mechanism is fulcrumed on a bistable shiftable support and operable on each forward stroke of the drive arm to open or straighten and on each rearward stroke of the drive arm to close or break about its fulcrum. A bistable trip lever also pivotally mounted on the drive arm is conditioned on each forward stroke of the drive arm to shift the position of the fulcrum support on each rearward stroke of the drive arm whereby the carbon ribbon is elevated alternately through full and partial strokes on succeeding forward strokes of the drive arm.

It is a principal object of the present invention to provide an improved ribbon-lifting mechanism for effecting movement necessary to drive a vibrator alternately through full and partial strokes.

Another object of the present invention is to provide an improved ribbon-lifting mechanism for use on a typewriter of the type bar type.



Still another object of the present invention is to provide a ribbon-lifting mechanism incorporating a positively driven toggle action for driving a carbon ribbon vibrator alternately through full and partial strokes.

Other objects and advantages of the present invention will be apparent from the following description, as illustrated in the accompanying drawing, which discloses by way of example the principles of the invention and a preferred embodiment thereof.

## BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

FIG. **1** is a perspective view of a portion of an electric typewriter employing twin vibrators.

FIG. **2** is a perspective view of a carbon ribbon vibrator elevating assembly in accordance with the present invention.

FIG. **3** is a perspective view of a manually controlled ribbon selector dial for coupling and uncoupling drive to the carbon ribbon vibrator elevating assembly illustrated in FIG. **2**.

FIG. **4**, like FIG. **2** is a view showing the carbon ribbon vibrator elevating toggle assembly in a rest position with its fulcrum in its lowermost position and conditioned to elevate and position the upper half of a carbon ribbon shown in FIG. **1** opposite a printing point.

FIG. **5** is a view showing the drive arm in forward motion and the carbon ribbon vibrator elevating toggle assembly straightening or opening about its fulcrum positioned in its lowermost position and a trip lever positioned to be conditioned to shift the fulcrum support to position the toggle assembly to its uppermost position during the rearward movement of the drive arm.

FIG. **6** is a view showing the drive arm at the end of the forward drive started in FIG. **5**, with the fulcrum of the carbon ribbon vibrator elevating toggle assembly in its lowermost position locating the upper half of the carbon ribbon viewed in FIG. **1** opposite the printing point, and the trip lever conditioned to shift the bistable support and position the fulcrum of the toggle assembly to its uppermost position on the next rearward stroke.

FIG. **7** is a view showing the drive arm in rearward motion and the carbon ribbon vibrator elevating toggle assembly being broken with its fulcrum still in its lowermost position and the trip lever commencing shifting of the bistable support to position the fulcrum of the toggle assembly to its uppermost position.

FIG. **8** is a view showing the drive arm in a rest position at the end of the rearward motion started in FIG. **7**, with the bistable support shifted and the fulcrum of the toggle assembly in its uppermost position whereby the toggle assembly is conditioned to elevate and position the lower half of the carbon ribbon shown in FIG. **1** opposite the printing point.

FIG. **9** is a view showing the drive arm being driven forward from the FIG. **8** position and the toggle assembly straightening or opening about its fulcrum which is still positioned in its uppermost position, and the trip lever positioned to be conditioned to shift the fulcrum to its lowermost position on the next rearward stroke.

FIG. **10** is a view showing the drive arm at the end of the forward drive started in FIG. **9**, with the fulcrum of the toggle assembly in its uppermost position locating the lower half of the carbon ribbon viewed in FIG. **1** opposite the printing point, and the trip lever conditioned to shift the bistable support and position the fulcrum of the toggle assembly to its lowermost position on the next rearward stroke.

FIG. **11** is a view showing the drive arm being driven rearwardly from the FIG. **10** position and the toggle assembly being broken with its fulcrum still in its uppermost position and the trip lever commencing shifting of the bistable support to position the fulcrum of the toggle assembly to its lowermost position at the end of the rearward stroke (FIG. **4**).

extend outwardly from the frame carried bracket **64**. An overcenter spring **69** mounted between the shifting support **62** and the frame bracket **64** alternately biases the shifting support plate **62** into contact with either the upper limit stop **67** of the lower limit stop **68**. With the end of the toggle link **59** is pivoted on stud **61** and the shifting plate **62** in contact with the upper limit stop **67**, the pivot stud **61** of the toggle assembly **57** is located in its uppermost position and whereby then the toggle assembly **57** is conditioned to elevate and position the lower half of the carbon ribbon CR shown in FIG. **1** opposite the printing point of the type bar **28** during the forward stroke of the drive link **47**. With the shifting plate **62** stud **61** in contact with the lower limit stop **68**, the pivot stud **61** of the toggle assembly **57** is in its lowermost position whereby during the toggle straightening stroke of the drive link **47** the toggle assembly **57** will elevate and position the upper half of the carbon ribbon CR shown in FIG. **1** opposite the printing point of the type bar **28**. The opposite shifting of the end of the toggle link **59** pivoted on the stud **61** between the upper limit stop **67** and the lower limit stop **68** commences as a result of movement applied to the ends of forwardly extending upper and lower arms **70** and **71** respectively of the shifting plate **62** overcoming the bias of the overcenter spring **69**.

A generally T-shaped trip lever **72** (as seen in FIG. **4**) pivotally mounted at its approximate midpoint on a stud **73** provided on the drive link **47**, has a pair of arms **74** and **75** with individual bent-out ears projections **76** and **77** at their respective ends, adapted to apply the necessary force to the end of arm **70** or to the end of arm **71** of the bistable shifting support **62** to overcome the prevalent bias of the overcenter spring **69** during the rearward stroke of the drive link **47**.

An ear **78**, bent out from the drive link **47**, is received in an arcuate cutout portion **79** in the trip lever **72** between arms **74** and **75**. The arcuate cutout portion **79** has an upper and a lower shoulder identified by numerals **80** and **81**. The trip lever **72** is provided with a central leg **82** having an overcenter spring **83** mounted between it and the drive link **47** to alternately bias either of the shoulders **80** and **81** into abutment with the ear **78**. Movement of the shoulders **80** and **81** relative to the ear **78** occurs as a result of the force of contact between the trip lever ear **77** and a projection **84** extending upwardly from the end of a lower forwardly extending arm of the frame bracket **64**, or as a result of the force of contact between the trip lever ear **76** and a projection **85** extending downwardly from the end of an upper forwardly extending arm of the frame bracket **64**, when the trip lever **72** through the stud **73** is carried forward by the drive link **47** as the latter is being actuated.

The correct path of the drive link **47** is assured by a stud stationary **80** on to the frame bracket member **64** which extends into a bifurcated slot **87** formed in the rear end portion of the drive link **47**. Thereby it is assured that the connection of the drive link **47** by its notch **48***a* with the stud **49** in the bail arm **11***a* does not accidentally become disrupted. Rearward, restoring movement of the drive link **47** is limited by a stop **88** formed on the frame bracket **64**.

In operation when the ribbon selector control wheel **45** is set to a carbon ribbon operational mode of operation as illustrated in FIG. **3**, and the carbon ribbon vibrator elevating toggle assembly **57** is in the rest position wherein its pivot stud **61** is in its lowermost position as illustrated in FIGS. **2** and **4**, the carbon ribbon vibrator elevating toggle assembly **57** is conditioned to elevate and position the upper half of the carbon ribbon CR shown in FIG. **1** opposite the printing point of the type bar **28** incident to the next type action.

When such next type action occurs, and the U-bar **11** and its upwardly extending arm **11***a* pivot counterclockwise about the cross-shaft, the drive link **47** moves forward.

As illustrated in FIG. **5**, as the drive link **47** moves forward in the direction of arrow A, from the position in FIG. **4** where it abuts the stop **88**, the bent out ear **77** extending from the arm **75** of the trip lever **72** strikes the projection **84** extending upwardly from the end of the lower forwardly extending arm of the frame bracket **64**, to pivot the trip lever **72** counterclockwise until the biasing action of the overcenter spring **83** takes over to complete the started movement so that thus the lower shoulder **81** formed by the arcuate cutout portion **79** in the trip lever **72** abuts the bent-out ear **78** on the drive link as illustrated in FIG. **6**. Thus the trip lever **72** is now positioned so that subsequently during the restoration of the drive link **47** the bistable shifting plate **62** is forcibly moved clockwise so that the toggle assembly **57** assumes the position seen in FIG. **8**.

As the drive link **47** arrives at its forwardmost position shown in FIG. **6** with the lower end of the toggle link **59** residing (in its lowermost position) in contact with the lower limit stop **68**, the toggle assembly **57** is straightened is pivoting the arm **63** and the vibrator-elevating rod **43** clockwise and thus is raising the carbon ribbon vibrator **13** through a partial stroke so as to position the upper half of the carbon ribbon shown in FIG. **1** opposite the printing point of the type bar **28**.

After reaching the forwardmost position shown in FIG. **6**, the drive link **47** restores to the rear by the spring **50**, causing the toggle assembly **57** to break or to the condition seen in FIG. **8** causing the return of the vibrator-elevating rod **43** and the vibrator **13** to their normal positions.

As viewed in FIG. **7** as the link is restoring to the rear from the FIG. **6** to the FIG. **8** position, as shown by arrow B, and since the trip lever **72** is conditioned to shift the fulcrum **61** of the toggle assembly **57** to its uppermost position, (the lower shoulder **81** of the arcuate cut out portion **79** of the trip lever **72** being in abutment with the ear **78**), the ear **76** extending from the arm **74** of the T-shaped trip lever **72** strikes the end of arm **70** of the bistable shifting support **62**, causing the shifting plate **62** to pivot clockwise about stud **66** until the biasing action of the overcenter spring **69** takes over and moves the shifting support **62** so that the toggle stud **61** moves to its upper position in contact with the upper limit stop **67** as shown in FIG. **8**, thus conditioning the toggle assembly **57** to have capacity to elevate and position the lower half of the carbon ribbon shown in FIG. **1** opposite the printing point of the type bar **28**, in response to the next type action.

With the next type action operation, the drive link **47** is actuated forward in the direction of arrow A as shown in FIG. **9** from the rearwardmost position illustrated in FIG. **8**, in response to the action of the U-bar **11** pivoting counterclockwise about cross shaft **14**. During this forward movement of the drive link **47**, the ear **76** extending from the arm **74** of the trip lever **72** strikes the projection **85** extending downwardly from the end of the upper forwardly extending arm of the frame bracket member **64**, pivoting the trip lever **72** clockwise until the biasing action of the overcenter spring **83** takes over so that the upper shoulder **80** of the arcuate cutout portion **79** in the trip lever **72** moves into abutment with the bent-out stop ear **78** on the drive arm as illustrated in FIG. **10**, thus conditioning the trip lever **72** to shift the fulcrum support **62** to position the toggle assembly **57** in its lowermost position on the next actuating movement of the drive link.

As the drive link **47** becomes actuated to its forwardmost position shown in FIG. **10**, with the toggle link **59** anchored on pivot stud **61** (in its uppermost position) in contact with the upper limit stop **67**, the toggle assembly **57** straightens about its joint **60** pivoting the arm **63** and the vibrator elevating rod **43** clockwise through a greater distance than before, thereby raising the vibrator **13** through a full stroke so as to position the lower half of the carbon ribbon shown in FIG. **1** opposite the printing point of the type bar **28**.

After reaching the forward position shown in FIG. **10**, the drive link **47** is restored again to the rear (in the direction of arrow B) by the spring **50**, causing the toggle assembly **57** to fold about its joint **60** and return the vibrator-elevating rod **43** and the vibrator **13** to their normal positions.

As viewed in FIG. **11**, the link **47** is being restored rearwardly since the trip lever **72** during the actuation of the link **47** was conditioned to shift the shift plate and **62** to position the toggle assembly **57** to its lowermost position (the shoulder

80 of the arcuate cutout portion 79 of the trip lever 72 being in abutment with the ear 78), the ear 77 extending from the arm 75 of the trip lever 72 strikes the end of the arm 71 of the shifting plate 62, causing the shifting plate 62 to pivot counterclockwise about stud 66 until the biasing action of the overcenter spring 69 takes over and moves the shifting plate 62 and the toggle link 59 anchored on pivot stud 61 to its lower most position in contact with the lower limit stop 68, returning the parts to the positions shown in FIG. 4 thus conditioning the toggle assembly 57 to elevate and position the upper half of the carbon ribbon CR shown in FIG. 1 opposite the printing point of type bar 28 in response to the next type action. The above describes the sequence for two type action operations whereby the carbon ribbon is elevated alternately to low and high positions and in conjunction with effecting a half letter space ribbon feed, whereby the type impressions on the ribbon define a zigzag pattern and utilize the optimum ribbon area.

I claim:

1. A ribbon-lifting mechanism comprising,
a frame,
vibrator-elevating means pivotally supported on said frame,
a ribbon vibrator mounted on said vibrator-elevating means,
a toggle mechanism including a first link having a first end pivotally joined to said vibrator-elevating means and a second link having a first end pivotally connected to a second end of said first link and forming therewith a toggle linkage,
bistably shiftable support means,
means on said bistably positionable support means carrying said second link pivotally at a second end thereof,
drive means connected to said toggle joint, operative in an actuating stoke to straighten the toggle mechanism and operative in a return stroke to fold said toggle mechanism,
automatic means operable in response to each return stroke of said drive means to shift the position of said bistably shiftable support means, whereby said ribbon vibrator is elevated alternately to one another positions incidental to alternate actuating strokes of said drive means,
said bistably shiftable support means including a pivotally mounted shifting plate movable in one direction from one position to a second position and movable in a counter-direction from said second position to said first position,
bias means connected to said shifting plate for alternately biasing said shifting plate to each of said positions after a partial movement thereto,
said automatic means including a two-armed, pivotally mounted bistable trip lever on said drive means, said trip lever in one bistable position on said drive means being capable in return stroke of said drive means to engage one portion of said pivotally mounted shifting plate to move it pivotally from said first to said second position and being capable in another bistable position to engage another portion of said shifting plate to move it pivotally from said second to said first position,
means cooperative between said drive means and said bistable trip lever to provide limits of pivotal movements for said trip lever,
an overcenter spring oppositely connected to said trip lever and said drive means for biasing said trip lever bistably to each of said pivotal limits after partial movements thereto,
a frame-supported projection in the path of one of said arms of said trip lever effective in successive alternate actuating strokes of said drive means to position said trip lever in one of its bistable positions,
and a frame-supported other projection in the path of the other of said arms of said trip lever effective in the other actuating strokes of said drive means to position said trip lever in its other bistable position.

2. In a machine having a selective typing mechanism operable to effect character imprints at a typing line,
a ribbon vibrator for projecting a ribbon from a retired position to either one of two positions over a printing line,
an element connected with said vibrator to operate it,
a mechanism responsive to the selective operation and restoration of said typing mechanism to effect respectively an operating and restoring movement of said element and connected vibrator and comprising,
a normally folded toggle linkage having a first link and a second link,
a pivotal joint between said links,
a pivotal joint connecting said element with said first link at a location spaced from the pivotal joint which connects it with said second link,
a means bistably positionable in one or another position for pivotally supporting said second toggle link in one or another basic pivot location at the link end thereof which is opposite to where it has a pivotal joint with said first toggle link,
and means respectively responsive to each selective operation of said typing mechanism followed by a restoration thereof, to impart respectively a straightening movement and a folding movement to said toggle,
and means operatively associated with said responsive means to effect in connection with each consecutive toggle-folding movement a movement of said bistably positionable supporting means from the bistable position it has occupied to its other bistable position,
said responsive means including a drive link to impart to said toggle linkage in conjunction with each selective operation and restoration of the typing mechanism a toggle straightening stroke followed reversely by a toggle-folding stroke,
said responsive means including means conditionable in response to each toggle-straightening stroke of said drive link, so that said bistably positionable means in dependency of its then prevalent bistable position will in the following toggle-folding stroke of said drive link become operated to the other bistable position.

3. The invention defined in claim 2,
said drive link being pivotally jointed with said toggle linkage so that said drive link in its toggle-straightening stroke moves in the direction of the straightening action of the toggle linkage to either one of two positions dependent on the prevalent basic pivot location said bistably positionable means then affords to the second toggle link,
and a trip means carried on said drive link and controllable thereby during the conclusion of its toggle-straightening stroke, due to the position to which said drive link moves in the direction of the straightening action of the toggle linkage, to become potent in the toggle-folding return stroke of said drive link to act on said bistably positionable means to reverse its bistable position.

4. The invention defined in claim 3,
two frame-supported abutments,
said trip means being a two-armed bistable member pivotally carried on said drive link, and the arms of said two-armed member during alternate toggle straightening strokes of said drive link being adapted to engage alternately one or the other of said abutments to cause opposite rocking movements of said two-armed bistable member, said two-armed bistable member, due to being alternately rocked in the toggle straightening strokes of said drive link, being effective in the toggle folding return strokes to act on said bistably positionable means to reverse its bistable position.

5. In a machine having a selective typing mechanism operable to effect character imprints at a typing line,
a ribbon vibrator for projecting a ribbon from a retired position to either one of two positions over a printing line,
an element connected with said vibrator to operate it,
a mechanism responsive to the selective operation and restoration of said typing mechanism to effect respectively an operating and a restoring movement of said element and connected vibrator and comprising,
a normally folded toggle linkage having a first link and a second link,
a pivotal joint between said links,

a pivotal joint connecting said element with said first link at a location spaced from the pivotal joint which connects it with said second link,

a means bistably positionable in one or another position for pivotally supporting said second toggle link in one or another basic pivot location at the link end thereof which is opposite to where it has a pivotal joint with said first toggle link,

and means respectively responsive to each selective operation and restoration of said typing mechanism, to impart to said toggle respectively a straightening movement and a folding movement,

and means operatively associated with said responsive means to effect in consequence of each consecutive toggle folding movement following a toggle straightening movement, a movement of said bistably positionable supporting means from the particular bistable position it has occupied to the other one of its bistable position.



6. The invention defined in claim 5,

said responsive means effecting during the restoration of said typing mechanism each time a forced partial movement of said bistably positionably means from whichever of said two positions it has occupied toward the other position,

and spring means cooperative with said bistably positionable means to complete each of its said started movements.