

H. H. STEELE.
TYPE WRITING MACHINE.
APPLICATION FILED APR. 25, 1911:

1,025,544.

Patented May 7, 1912.

3 SHEETS-SHEET 1.

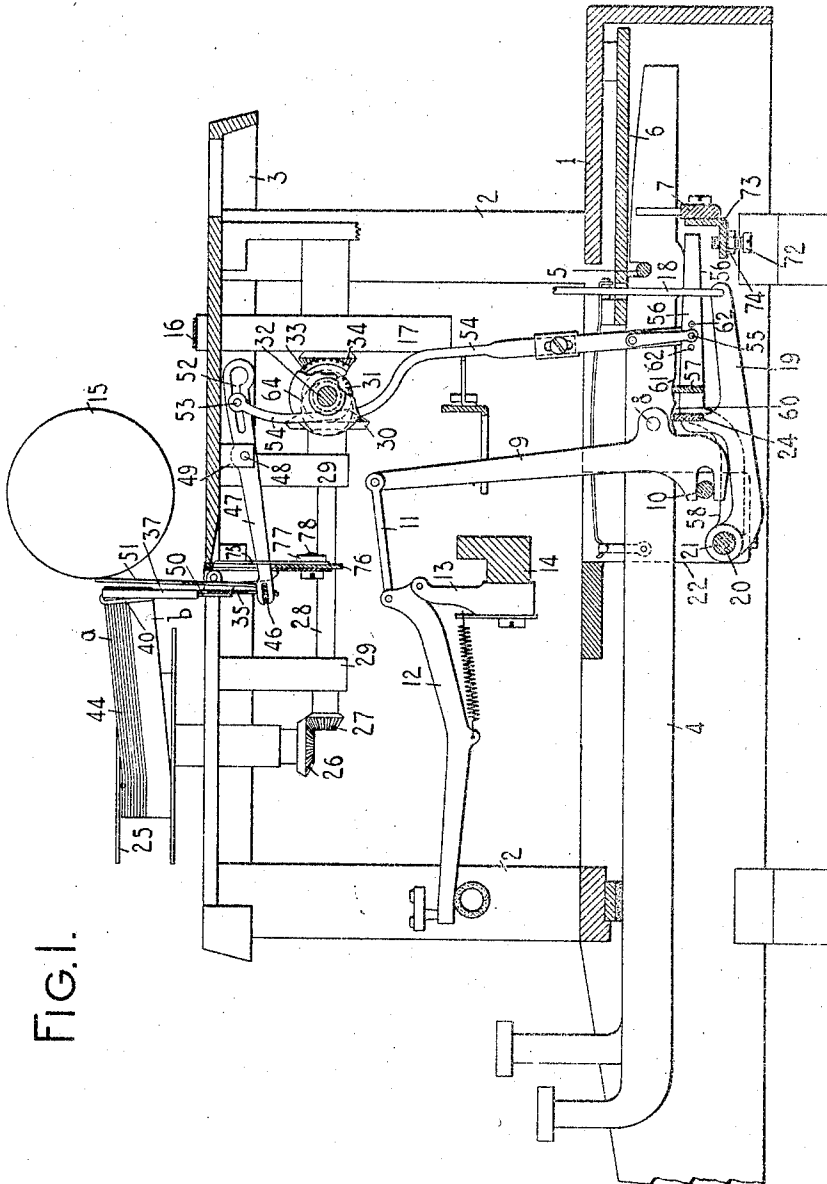


FIG. 1.

WITNESSES:

E. M. Wells.

M. W. Pool

INVENTOR:

Herbert H. Steele

By Jacob F. Felt

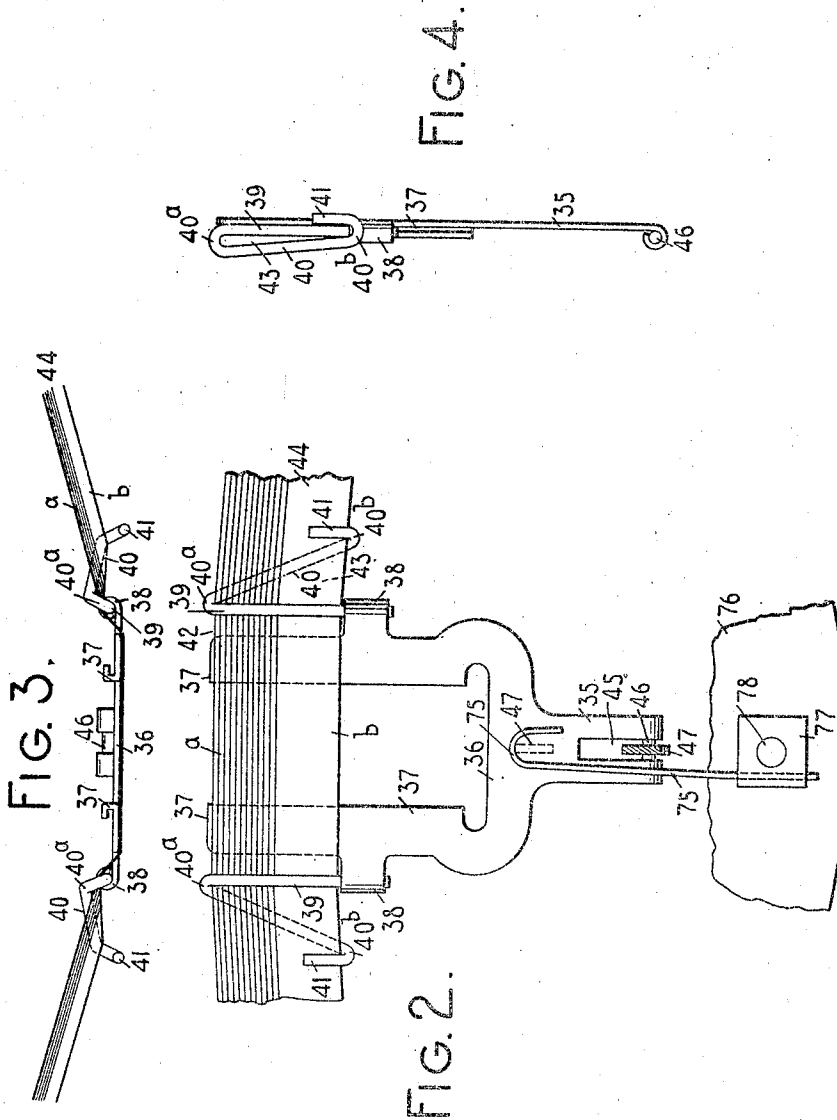
HIS ATTORNEY

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3 SHEETS-SHEET 2.



WITNESSES:
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3 SHEETS—SHEET 3.

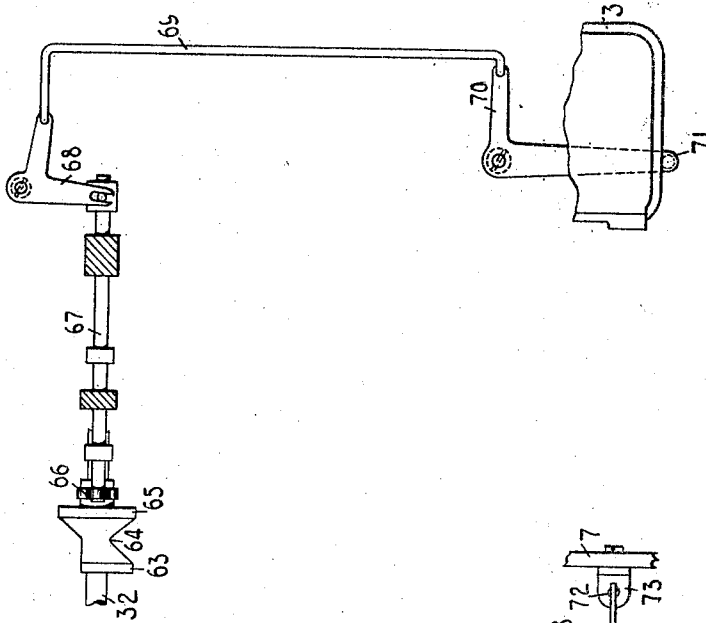


FIG. 6.

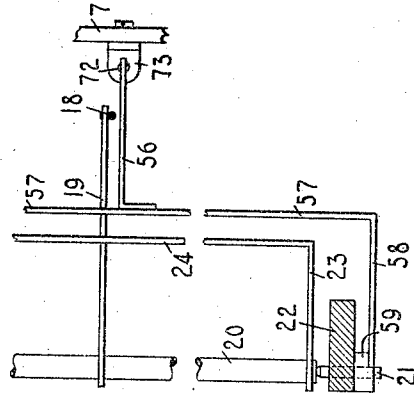


FIG. 5.

WITNESSES:

E. M. Mills.
m. v. boe.

INVENTOR:

Herbert H. Steele
By Jacob F. Hill

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UNITED STATES PATENT OFFICE.

HERBERT H. STEELE, OF MARCELLUS, NEW YORK, ASSIGNOR TO THE MONARCH TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,025,544.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed April 25, 1911. Serial No. 623,201.

To all whom it may concern:

Be it known that I, HERBERT H. STEELE, citizen of the United States, and resident of Marcellus, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to ribbon mechanisms for typewriting machines and its general object is to improve the same.

More specifically one object of my invention is to provide improved ribbon stop mechanism.

Another object of my invention is to provide an improved ribbon vibrator.

To the above and other ends my invention consists in the features of construction, arrangements of parts and combinations of devices to be hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a fragmentary vertical front to rear sectional view of a Monarch typewriting machine to which my invention is shown applied. Fig. 2 is a rear elevation partly in section showing the ribbon vibrator, the ribbon operating lever and the stop cooperative with said lever. Fig. 3 is a top plan view of the ribbon vibrator. Fig. 4 is a side elevation of the ribbon vibrator. Fig. 5 is a plan view of the universal bars and the method of mounting the same. Fig. 6 is a plan view showing the ribbon throw varying mechanism.

Referring to Fig. 1, the main frame of the machine comprises a base 1, corner posts 2 and a top plate 3. Key levers 4 are fulcrumed at the rear of the base, each key lever cooperating with a guide rod 5 and a fulcrum plate 6. Behind the rod 5 the key levers cooperate with a stationary comb plate 7. Pivoted at 8 to each key lever is a sub-lever 9 cooperative with a fixed abutment 10 and connected at its upper end by a link 11 to a type bar 12. The series of type bars are pivoted in hangers 13 which are secured to a support or segment 14. The type bars are adapted to cooperate with the front face of a platen 15 which is diagrammatically shown, said platen being mounted in a traveling carriage (not shown), said carriage being connected by a band 16 with a spring drum 17. The letter space movements of the carriage are controlled by

escapement devices (not shown), said devices being connected by a link 18 with an arm 19 secured to the middle portion of a rock shaft 20 which, as shown in Fig. 5, is supported at its ends on fulcrum pins 21 secured in brackets or lugs 22 on the base 1 of the machine. The rock shaft 20 carries a universal bar which comprises end bars 23 and a universal bar proper 24, the same being rigid with the central arm 19 and the other parts of the universal bar frame.

The usual ribbon spools are provided, the left-hand one 25 being shown. The ribbon spools are arranged above the top plate and horizontally disposed forward of the platen, one at each side of the machine. Each ribbon spool is connected to a beveled pinion 26 which meshes with a pinion 27 on the front end of a horizontal shaft 28 bearing in lugs 29 and provided at its rear end with an operating pinion 30 which is adapted to mesh with a driving pinion 31 fixed to a driving or power shaft 32, said shaft being connected by devices including intermeshing beveled pinions 33 and 34 with the spring drum 17. This is the ordinary Monarch construction and need not be further described. It will be understood that the turning of the spring drum to advance the carriage in letter space direction operates to rotate the power shaft 32. The two driving pinions 31 are spaced apart so that only one of them can engage at a time with its associate pinion 30 to connect the power shaft with one of the ribbon spools. By sliding the power shaft back and forth lengthwise, which may be done without breaking its connection with the spring drum 17, said power shaft is caused to engage alternately with the trains of mechanism connected to the ribbon spools, enabling the ribbon spools to be driven in alternation to feed the ribbon lengthwise in opposite directions.

Midway between the ribbon spools the ribbon is threaded through a ribbon carrier or vibrator which is best shown in Figs. 2 to 4. The body of said vibrator is preferably made of sheet metal and comprises a stem 35 and a cross bar 36 from which rise parallel slides or arms 37. Each upright is provided at about its middle with a laterally extending lug 38 which is curled or bent to receive the lower end of a guide member or wire, the latter being suitably secured in the

socket formed in the curl of the lug 38. Each guide wire comprises a vertically extending upright portion 39 from the top of which extends downward an inclined portion 40, the same terminating at its lower end in an upward and rearward bend or hook 41. Each upright 39 forms with the upper portion of the adjacent arm 37 a slot 42 having substantially parallel sides and open at its upper end. As appears from Fig. 4, the inner edge of this slot formed by the edge of the arm 37 is in rear of its outer edge which is rounded and is formed by the upright 39. The two parts 39 and 40 also form a slot, numbered for descriptive purposes as 43, said slot being V-shaped viewed from the front, and open at its lower end. The portions 40 incline downward and outward at an angle of some 25° from the vertical, as appears from Fig. 2, and also incline rearward as is apparent from Fig. 4.

The ribbon 44, which in the present instance is shown as divided longitudinally into fields *a* and *b* having different characteristics, is led off from the ribbon spools and directed rearward and slightly upward toward the vibrator and is so threaded through the vibrator that, as clearly shown in Figs. 2 and 3 its printing portion passes behind the upper portions of the arms or slides 37. Thence the ribbon passes forward over the upright wires 39, thence behind the inclined wires 40 and thence over and in front of the hooked ends 41.

Owing to the rearward inclination of the guide portions 40 the lower edge portion of the ribbon is directed rearward and the slack due to the upward inclination of the ribbon from the spools to the vibrator is taken up as a consequence. Also the ribbon is held flat closely against the rear flat faces of the arms 37. Furthermore, the uprights 39 cooperate with the slides 37 and the inclined and hooked guide portions 40 and 41 to iron out or flatten the ribbon as it is fed or drawn through the vibrator and thus overcome the tendency of the ribbon to bulge between its edges due to the constant impacting of the types thereagainst. Moreover, by lessening the downward inclination of the guide portions 40 the vertical distance between the closed ends 40^a and 40^b (formed by the junction of the inclined portion 40 respectively with the vertical portion 39 and the hooked portion 41) may be increased. Similarly by increasing the amount of the inclination of the portions 40 the vertical distance between the closed ends 40^a and 40^b may be decreased. By thus adjusting the parts the ribbon may be closely engaged at its top and bottom and slipping movement of the ribbon widthwise on its support prevented. Further, it will be observed that the ribbon is entirely inclosed so that chance of accidental displacement from the vibrator

is minimized and yet the ribbon may readily be threaded and unthreaded at pleasure. One purpose of the described construction is to overcome the defects in operation heretofore occasionally met with due to catching of the lower edge portion of the ribbon on the top of the line finder and card guide or other devices at and near the printing point. This catching of the ribbon and the consequent impeding and obstructing of the vibrator and connected parts, as well as sometimes the disengagement of the ribbon from its vibrator, is minimized by my improved arrangement and construction of the guiding and controlling devices for the ribbon.

The stem 35 of the vibrator is formed with a slot 45 bridged by a cross pin 46, which engages the slotted forward end of an operating lever 47 (Figs. 1 and 2). The operating lever is fulcrumed at 48 on a fixed block 49 and is adapted to be operated to vibrate the ribbon vibrator up and down at printing operations. The vibratory movements of the vibrator are guided and controlled by a stationary guide 50 which also supports a line finder and card guide 51, the same extending upward to the platen behind the vibrator. The rear arm of the operating lever 47 has a slot 52 which is engaged by a stud 53 secured at the upper end of a link 54. The lower end of said link is detachably connected at 55 with a central arm 56 extending rearward from a universal bar or bail which comprises a universal bar proper 57 secured at its ends to arms 58, said arms terminating in hubs 59 which bear on the fulcrum pins 21 outside the brackets 22.

It will be understood that each key lever operates on both the universal bar 24 and the universal bar 57, the universal bar 24 actuating the escapement and the universal bar 57 actuating the ribbon vibrator. Each key lever is cut out as indicated at 60 and 61 to cooperate respectively with the universal bars 24 and 57. The cut-out 61 is shallower than the cut-out 60 so that the bar 57 and ribbon vibrator are picked up by the actuated key lever before said key lever contacts with the universal bar 24. The connection or stud 55 at the lower end of the link 54 is adapted to engage with any one of a series of holes 62 in the arm 56 to vary the point of connection with said arm and thereby increase or decrease the amount of motion transmitted to the link 54. The position of the upper part of said link, with respect to the operating lever 47, may be varied by known devices comprising a manually settable controlling member comprising an eccentric operating face 63, and two concentric operating faces 64 and 65 of different diameters. When a plain or uniform ribbon is used the eccentric face is employed to give a cross or serpentine feed. The faces 64 and 65 are used for two-color work or similar

work. When the face 64 is in operation as shown in Fig. 1, the link 54 operates near the rear end of the slot 52 so as to communicate the least extent of movement to the operating lever and bring the upper field *a* of the ribbon into use at printing operation. By resetting the controlling member or sliding it transversely of the link 54 the face 65 may be brought into operation, thereby positioning the link near the forward end of the slot 52, increasing the throw of the operating lever and raising the lower ribbon field *b* to the types. The controlling member is slidable on the power shaft 32 so as to bring the faces 63, 64 and 65 into use at will. For thus controlling the member, devices of the usual sort may be used comprising an upright forked member 66 connected to said controlling member and secured to a slide rod 67 (Fig. 6), said slide rod being connected to a bell crank 68 which in turn is connected by a link 69 to a second bell crank 70, said bell crank 70 having a forwardly extending arm terminating in a finger piece 71 operative on the front of the machine.

Stop devices are provided for limiting the movement of the vibrator so as to confine the print to whichever ribbon field is in use. Said stop devices comprise a screw stop 72 which is supported on a bracket 73 suitably secured to the comb plate 7. As shown in Fig. 1 the screw stop 72 projects upward through the horizontal portion of the bracket and underlies the rear end of the central arm 56, being so positioned as to limit the downward movement of said arm. The screw stop 72 is provided with a nut 74 enabling the screw stop to be accurately adjusted so as to arrest the arm 56 and the train of mechanism connected therewith up to and including the vibrator in such position that the vibrator will be arrested when the field *a* covers the printing point. Excess movement is thus prevented and the printing is confined to the ribbon field *a*.

When the link 54 is shifted forward so as to bring the lower ribbon field *b* into use, the arm 56 will strike the stop 72 as before, but since the link operates so near the fulcrum of the operating lever and the slot 52 is pitched or inclined downward toward the end of the movement, the ribbon vibrator will tend to overthrow. To prevent this overthrow a second stop is provided which is adapted to cooperate with the operating lever itself. This second stop comprises preferably a wire 75, hook-like in form, the upper end of which curves over the path of the operating lever 47, the curved end being located so that when the operating lever reaches the point at which its movement should cease in order properly to present the lower ribbon field to the types said operating lever will contact with the wire stop 75 and will be arrested as shown by dotted

lines in Fig. 2. Said stop extends downward behind the usual stationary front plate or shield 76 and is secured against the rear of said plate by a nut 77 which engages a screw 78 supported on said shield. By loosening the nut 77 the stop 75 may be adjusted.

It will be observed that by my present invention I provide, in combination with ribbon vibrating mechanism, varying mechanism by which the extent of vibration of the ribbon may be altered, ribbon stop devices, comprising in the present instance the parts 56 and 72, which devices are constantly operative at each vibrating operation of the ribbon; that other ribbon stop devices, in the present instance comprising the stop 75 and the upper edge of the operating lever 47, are provided which are intermittently operative, that is, which operate only at times as, in the present instance, when the vibrating mechanism is set to give a particular extent of throw to the ribbon, this throw being the greatest throw or vibration of which the ribbon is capable; that a plurality of sets of ribbon stop devices are provided, one set being composed of the stop 72 and the arm 56, and the other set being composed of the stop 75 and the upper edge of the lever 47; that these sets of stop devices are concurrently operative; that they cooperate with different parts of the ribbon vibrating mechanism; that one of these sets is operative for both extents of movement of the ribbon vibrating mechanism; that the other set is operative for only one extent of movement; that the ribbon stops are independent of the setting movements of the actuating link 54, that is, the actuating link may be set by the controlling member 63-65 without affecting the stops, which will remain quiescent during such setting and resetting of the link; that two sets of stop devices are provided at opposite ends of the train of mechanism connecting the vibrator with the printing key levers, said stop devices substantially confining between them said train of mechanism; and that the upper or hair-pin stop device is a safety device which acts on the operating lever to supplement the lower set of stop devices and insure against the increased tendency to overthrow when the ribbon is set for the long throw. Furthermore, it will be noted that by my present invention a ribbon vibrator is provided which comprises sets of guiding devices, each set of guiding devices in the present instance being composed of one of the guide wires 39, 40, 41 in conjunction with the upper portion of one of the arms or slides 37; that each set of guide devices forms or provides a pair of slots; that the dividing wall between each pair of slots in the present instance is formed by one of the

uprights 39 which provides rounded or curved edges for the slot walls; that each pair of slots is open at opposite ends, the inner slot 42 being open at the top, and the outer slot 43 being open at the bottom; that the slots of each pair are in different planes, as will be apparent from a consideration of Fig. 4; that the walls of the inner slot 42 of each pair are substantially parallel while the walls of the outer slot 43 are at an angle, the slot 43 being shaped like an inverted V; that each guide wire in its entirety comprises an inclined portion 40, and two substantially upright portions 39 and 41 extending oppositely from the ends of said inclined portion; that each one of the guide wires completely surrounds the ribbon, as will be readily apparent from a consideration of Fig. 4; and that each guide wire is adjustable, by changing the angle of lateral inclination of the portion 40, so as to coöperate closely with the edge portions of the ribbon, thus compensating for different widths of ribbon, or for a different fore and aft inclination of the same ribbon due to a change or variation in adjustment of the fore and aft inclination of the guide portion 40.

Various changes may be made without departing from the spirit and scope of my invention; parts of it may, of course, be used without other parts, for instance, the ribbon stop mechanism may be employed in connection with a different style of vibrator than that herein shown and claimed; and various features of my novel vibrator may be selected and adapted to other vibrators which may differ in some respects from the vibrator illustrated herein.

The ribbon mechanism herein generally shown and described will be found more fully illustrated and set forth more at length in patent to George A. Seib, No. 863,947, granted August 20, 1907.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination with ribbon vibrating mechanism, varying mechanism for the vibrating mechanism, ribbon stop devices constantly operative at each vibrating operation, and other ribbon stop devices intermittently operative.

2. In a typewriting machine, the combination with ribbon vibrating mechanism, varying mechanism for the vibrating mechanism, ribbon stop devices constantly operative at each vibrating operation, and other ribbon stop devices operative for only one extent of throw of the ribbon vibrating mechanism.

3. In a typewriting machine, the combination of ribbon vibrating mechanism, varying mechanism for the vibrating mechanism, a ribbon stop operative at each vi-

brating operation, and a second ribbon stop operative only when the vibrator is given its greatest extent of movement.

4. In a typewriting machine, the combination of ribbon vibrating mechanism, varying mechanism for the vibrating mechanism, and a plurality of sets of ribbon stop devices, said sets being capable of concurrent operation.

5. In a typewriting machine, the combination of ribbon vibrating mechanism, varying mechanism for the vibrating mechanism, and a plurality of sets of ribbon stop devices, said sets being capable of concurrent operation on different parts of said ribbon vibrating mechanism.

6. In a typewriting machine, the combination of ribbon vibrating mechanism, varying mechanism for the vibrating mechanism, and a plurality of sets of ribbon stop devices, said sets being capable of concurrent operation, one only of said sets being operative for both extents of movement of said ribbon vibrating mechanism.

7. In a typewriting machine, the combination of a ribbon vibrator, vibrating devices, a key operated universal bar connected thereto, said universal bar being independent of the escapement mechanism of the machine, and a ribbon stop coöperative with said universal bar.

8. In a typewriting machine, the combination of a ribbon vibrator, vibrating mechanism including an operating lever, a key operated universal bar, a ribbon stop coöperative with said universal bar, and a second ribbon stop coöperative with said operating lever.

9. In a typewriting machine, the combination of a ribbon vibrator, vibrating mechanism including an operating lever, a key operated universal bar, a ribbon stop coöperative with said universal bar, and a second ribbon stop coöperative with said operating lever, said ribbon stops being capable of concurrent operation.

10. In a typewriting machine, the combination of ribbon vibrating mechanism, varying mechanism therefor, and two ribbon stops, one operative for both extents of movement of the vibrating mechanism and the other operative for one only of said extents of movement.

11. In a typewriting machine, the combination of a ribbon vibrator, vibrating devices including an operating lever, varying mechanism for said vibrating devices, a key actuated universal bar, and two ribbon stops one coöperative with said universal bar for both extents of movement of the vibrator and the other coöperative with said operating lever for one only of said extents of movement.

12. In a typewriting machine, the combination of a ribbon vibrator, an operating

lever, a key actuated universal bar, connections including a link between said universal bar and said operating lever, hand controlled devices for setting said link to operate variably on said operating lever, and ribbon stops for both extents of movement of said lever, both of said stops being independent of the setting movements of said link.

13. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, a key actuated universal bar, connections including a link between said universal bar and said operating lever, hand controlled devices for setting said link to operate variably on said operating lever, a ribbon stop cooperative with said operating lever, and a second ribbon stop cooperative with said universal bar.

14. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, a key actuated universal bar, connections including a link between said universal bar and said operating lever, hand controlled devices for setting said link to operate variably on said operating lever, a ribbon stop cooperative with said operating lever, and a second ribbon stop cooperative with said universal bar, said ribbon stops operating concurrently when the vibrator is given its greatest extent of vibration.

15. In a front-strike typewriting machine, the combination of a ribbon vibrator, actuating devices therefor including an operating lever directly connected to said vibrator, a ribbon stop comprising an upright hook which lies in the path of said operating lever, said hook having a stationary support, and means for adjustably clamping said hook to its stationary support.

16. A ribbon vibrator for typewriting machines comprising a plurality of sets of guiding devices, each set of devices forming a pair of slots, the dividing wall between said pair of slots being rounded.

17. A ribbon vibrator for typewriting machines comprising a plurality of sets of guiding devices, each set of devices forming a pair of slots, the slots of said pair being open at opposite ends.

18. A ribbon vibrator for typewriting machines comprising a plurality of sets of guiding devices, each set of devices forming a pair of slots, the slots of said pair being in different planes.

19. A ribbon vibrator for typewriting machines comprising a plurality of sets of guiding devices, each set of devices forming a pair of slots, the walls of one slot of each pair being substantially parallel, and the walls of the other slot being inclined to each other.

20. A ribbon vibrator for typewriting machines comprising a pair of guide wires, each guide wire comprising an inclined por-

tion and two substantially upright portions extending oppositely from the ends of said inclined portion.

21. A ribbon vibrator for typewriting machines comprising a body portion and a pair of guide wires, each guide wire cooperating with the body portion and providing a pair of slots.

22. A ribbon vibrator for typewriting machines comprising a body portion and a pair of guide wires, each guide wire being adjustable to compensate for different widths of ribbon.

23. A ribbon vibrator for typewriting machines comprising a body portion and a pair of guide wires, each guide wire comprising a laterally extending portion which is also inclined at an angle fore and aft of the machine.

24. A ribbon vibrator for typewriting machines comprising parallel arms or slides, and guides, each comprising a vertical portion, a portion inclining downwardly from the top of said vertical portion, and a hook extending upward from the lower end of said inclined portion.

25. A ribbon vibrator for typewriting machines comprising parallel arms and also guides, each guide comprising a vertical portion, a portion inclining downward from the top of said vertical portion, and a hook extending upward from the lower end of said inclined portion, said downwardly inclined portion being also inclined rearward.

26. A ribbon vibrator for typewriting machines, comprising parallel arms and also guides, each guide comprising a vertical portion, a portion inclining downward from the top of said vertical portion, and a hook extending upward from the lower end of said inclined portion, the vertical portions being in a plane forward of the rear faces of the parallel uprights.

27. A ribbon vibrator for typewriting machines comprising parallel arms or slides and also guides, each guide comprising a vertical portion, a portion inclining downward from the top of said vertical portion, and a hook extending upward from the lower end of said inclined portion, the ribbon being threaded behind said slides, in front of said vertical portions and behind said inclined portions.

28. A ribbon vibrator for typewriting machines comprising parallel arms or slides and also guides, each guide comprising a vertical portion, a portion inclining downward from the top of said vertical portion, and a hook extending upward from the lower end of said inclined portion, the inclined portions having closed ends which are adjustable to closely engage opposite edge portions of the ribbon.

29. In a typewriting machine, the combination of a ribbon vibrator, a key lever, a

train of actuating devices between said key lever and said vibrator, and two sets of ribbon stop devices, one set at each end of said train, the sets of stop devices substantially
5 confining between them the train of actuating devices.

30. In a typewriting machine, the combination of a ribbon vibrator, ribbon actuating devices, throw varying devices, a set of
10 ribbon stops, and a supplemental ribbon stop acting as a safety device to overcome the additional tendency to overthrow when the lower field of the ribbon is in use.

31. In a typewriting machine, the combination of a ribbon vibrator, a ribbon operating lever, key actuated devices connected
15 with said lever, throw varying means, and

a stop device permanently in the path of said lever but operative only on the long throw of the ribbon vibrator. 20

32. In a typewriting machine provided with mechanism both for vibrating the ribbon, and for varying the vibrating mechanism and with ribbon stop devices constantly
25 operative at each vibrating operation and also provided with intermittently operating ribbon stop devices.

Signed at Syracuse, in the county of Onondaga and State of New York, this 22nd day of April A. D. 1911.

HERBERT H. STEELE.

Witnesses:

WILLARD C. HAY,
BESSIE G. KITTELL.