

J. FELBEL.
TYPE WRITING MACHINE.
APPLICATION FILED FEB. 23, 1911.

1,040,298.

Patented Oct. 8, 1912.
3 SHEETS-SHEET 1.

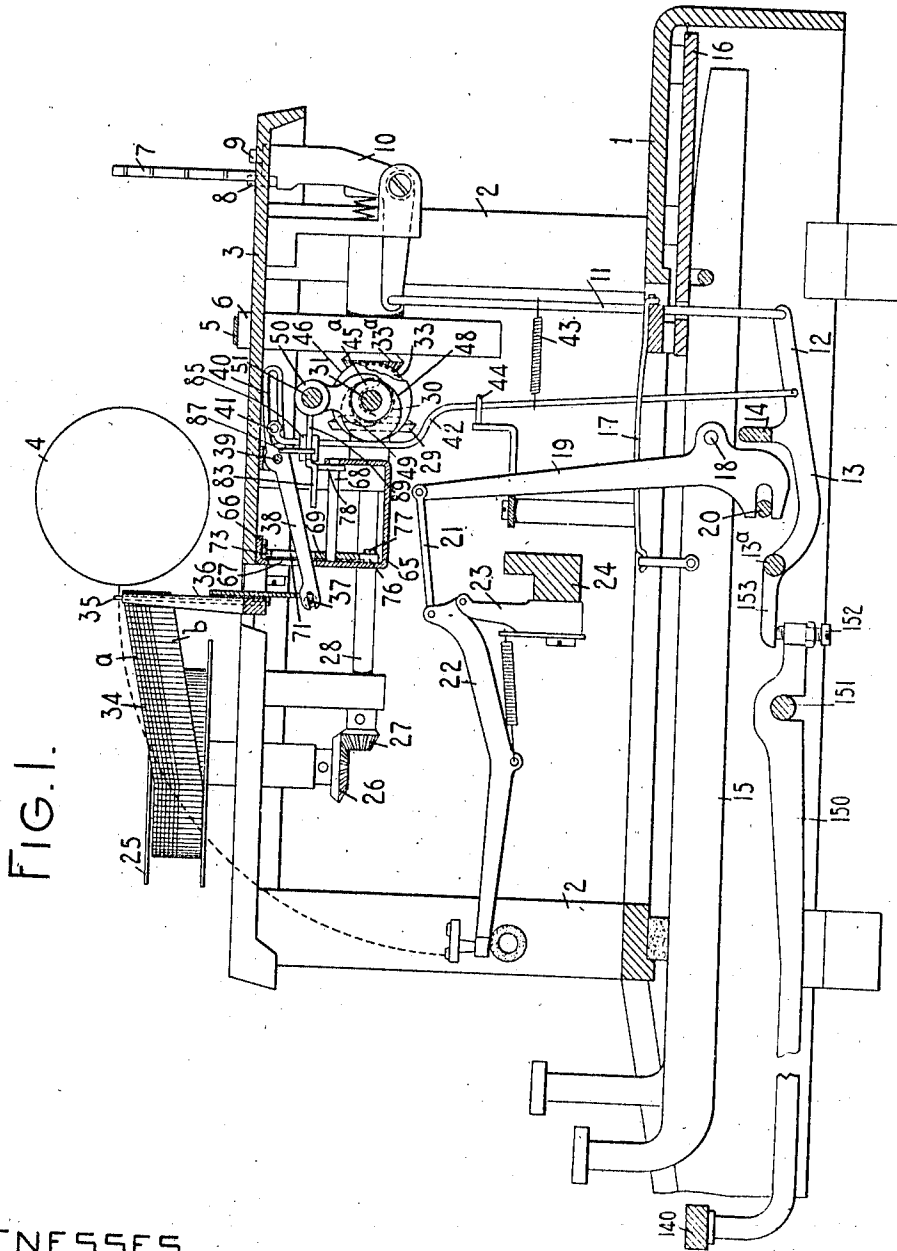


FIG. 1.

WITNESSES.

E. M. Wells
M. W. Pool

INVENTOR.

Jacob Felbel

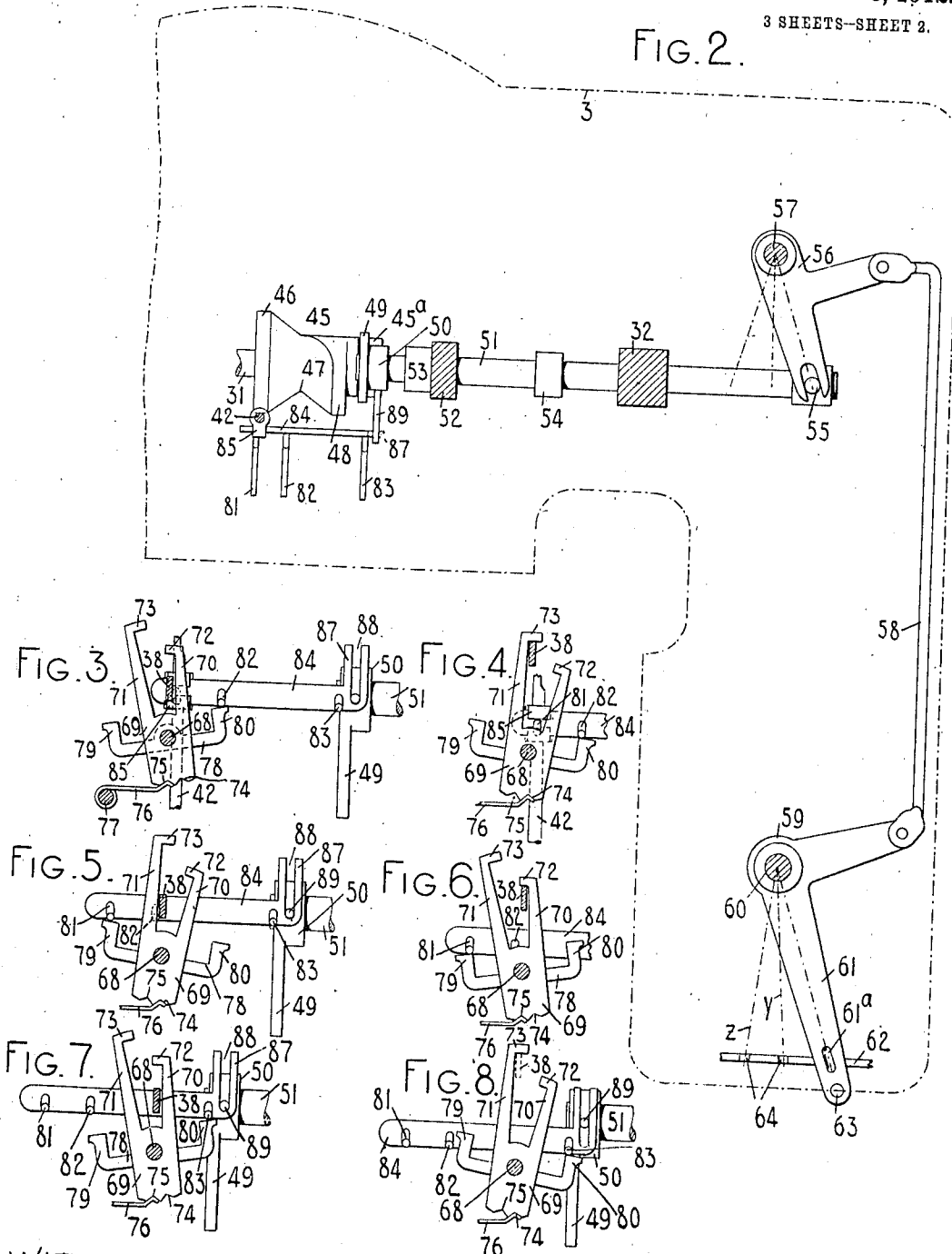
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3 SHEETS-SHEET 2.

FIG. 2.



WITNESSES:

E. M. Wells
M. W. Pool

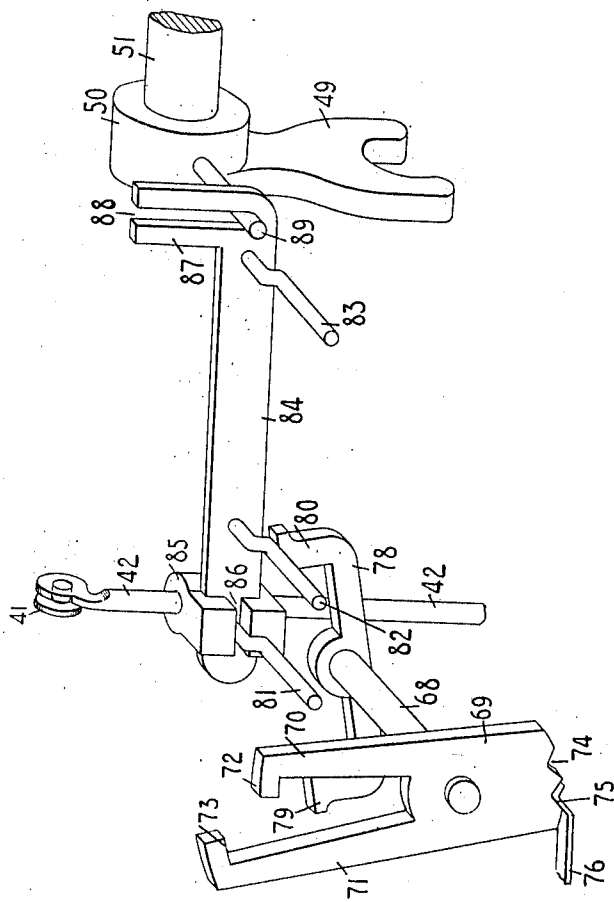
INVENTOR:

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3 SHEETS-SHEET 3.

FIG. 9.



WITNESSES:

E. M. Wells

m. w. Pool

INVENTOR:

Jacob Felbel

UNITED STATES PATENT OFFICE.

JACOB FELBEL, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNION TYPEWRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

1,040,298.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Application filed February 23, 1911. Serial No. 610,143.

To all whom it may concern:

Be it known that I, JACOB FELBEL, citizen of the United States, and resident of the borough of Manhattan, city of New York, in the county of New York 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 principal object is to provide improved mechanism of the character specified.

More specifically the object of my invention is to provide ribbon stop mechanism which is separate from the ribbon throw-varying mechanism, thus permitting both said mechanisms to be independently and accurately adjusted; and also to provide a ribbon stop mechanism capable of being set, adjusted or shifted positively to limit the throw of the ribbon under the action of the ribbon vibrating means, which stop mechanism shall be automatically set or adjusted by the striking of the space key or any of the printing keys after adjustment of the throw-varying means, or in other words, shall be set or adjusted during the operation of the machine for writing—which includes spacing as well as printing.

To the above and other ends my invention consists in the features of construction, combinations of devices and arrangements of parts 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 embodying my invention. Fig. 2 is a horizontal sectional view taken below the top plate and showing parts of the actuating, throw-varying and stop devices for the ribbon. Fig. 3 is a front elevation partly in section of the stop devices prior to a resetting operation. Fig. 4 is a corresponding view showing the stop devices reset, some parts shown in Fig. 3 being omitted from Fig. 4. Figs. 5 to 8 are operating views, Figs. 5 and 7 corresponding to Fig. 3, and

Figs. 6 and 8 to Fig. 4. Fig. 9 is a perspective view of parts of the ribbon actuating and stop devices.

The frame of the Monarch machine as appears from Fig. 1 comprises a base 1, posts 2 and a top plate 3, above which is supported an endwise movable platen 4 diagrammatically illustrated, said platen being mounted in a traveling carriage (not shown) which is connected by a band 5 with a spring drum 6 so that said carriage is constantly impelled leftward; its movements in this direction being controlled by letter space feeding devices which comprise an escapement wheel 7 and cooperating dogs 8 and 9 supported on a dog rocker 10 connected by a link 11 with an arm 12 on a universal bar frame 13 pivoted at 13^a and which carries a universal bar 14. Said universal bar underlies a set of printing key levers 15, each fulcrumed on a plate 16 and provided with a restoring spring 17. Pivoted at 18 to each key lever is a sub-lever 19 slotted at its lower end to cooperate with a fixed abutment 20 and connected at its upper end by a link 21 with a type bar 22 pivoted on a hanger 23 secured to the front face of a shiftable type bar segment 24, the type bars cooperating with the front face of the platen 4.

The universal bar frame and hence the links 11 and 42 connected thereto are in a Monarch machine also operated by a space bar or key 140 attached to a lever frame 150 fulcrumed on a cross bar 151 and provided at its rear end with contact screws 152 which bear upwardly against a forward extension 153 of the universal bar frame so that when the space key 140 is depressed the universal bar frame is caused to descend with the links 11 and 42 in the same way as when the key levers 15 are depressed.

Ribbon spools 25, one of which is shown, are arranged horizontally above the top plate, one at each side of the machine and forward of the platen. Each ribbon spool is connected to a small beveled gear wheel 26 which meshes with a beveled pinion 27 carried at the front of a horizontal shaft 28, the rear end whereof is provided with a bev-

eled gear 29 which is adapted to mesh with a gear wheel 30 fixed to a driving shaft 31 supported on lugs 32 depending from the top plate. The driving shaft is operatively
5 connected with the spring drum 6 by devices which comprise beveled gear wheels 33 and 33^a in such manner that when the spring drum turns to advance the carriage in printing direction rotary movements will
10 be communicated to the driving shaft 31. Said driving shaft is movable endwise in a known manner to alternately connect with the beveled gear wheels 29, thus driving the ribbon spools in alternation and feeding the
15 ribbon longitudinally back and forth from one spool to the other.

A ribbon 34 is wound on the ribbon spools 25 and midway between said spools is threaded through the slots of a vibratory
20 ribbon carrier or vibrator 35 which is slidably supported on an upright guide 36 and normally maintains the ribbon below the printing point. The lower end or stem of the vibrator is pivotally connected at 37
25 with an operating lever 38 having a fixed fulcrum 39. The rear arm of the operating lever has a slot 40 with which engages an actuating stud 41 projecting laterally from the top of an actuating link 42 pivotally
30 connected at its lower end to the arm 12 of the universal bar frame. A coiled spring 43 constantly urges the link 42 to swing rearward on its pivot and the swinging movements of the link are suitably controlled by
35 a stationary guide 44 which prevents lateral or transverse movements of said link.

The spring 43 coöperates with a link controller 45 to set the link 42 so as to vary the normal location of the stud 41 relatively
40 to the fulcrum 39 and thereby alter the extent of throw communicated to the operating lever 38, vibrator 35 and the printing portion of the ribbon. The controller 45 is slidably mounted on the driving shaft 31
45 but is connected to turn therewith, and said controller is provided with three operative faces 46, 47 and 48 (shown in Figs. 1 and 2) which are adapted to coöperate with and control the position of the link 42. The
50 faces 46 and 47 are circular and are concentric with the axis of the shaft 31, the face 46 having a larger diameter than the face 47 and coöperating with the link 42 to set it as in Fig. 1 so as to communicate the great-
55 est throw to the operating lever and ribbon 34 and thus present the lower portion or field *b* of the ribbon to the types. The operative faces are connected by inclined or cam faces so that by sliding the controller 45
60 along the shaft 31 the operative faces may be caused to engage at will with the link 42. When the lesser circular face 47 is moved into operative position the link 42 will be drawn rearward by the spring 43 to engage

said lesser face 47 and thereby will position the actuating stud 41 at the rear end of the slot 40 so as to operate the lever 38 and vibrator 35 to the least extent, vibrating the ribbon only far enough to present the upper widthwise portion or printing field *a* to
65 the types. The ribbon fields *a* and *b* as herein shown are of different characteristics or colors, the ribbon 34 as illustrated being what is commonly termed a two-color ribbon; but, of course, a ribbon having uni-
70 form characteristics throughout may be employed, in which case the operating face 48 of the controller is preferably made use of to automatically vary the throw of the ribbon progressively or step-by-step, giving
80 it what is commonly called the cross feed or snake feed, a well known characteristic of the Monarch machine. The operative face 48 is eccentric to the axis of the shaft 31 and at one point has a radius equal to that
85 of the face 46, decreasing until the radius equals that of the lesser face 47, the construction being such that when the eccentric face is in use it coöperates with the spring
90 43 to move the link 42 back and forth along the slot 40 so that the ribbon will be given its greatest extent of throw at one time and thence its throw will gradually decrease until its least extent of throw is reached, after which it will again increase, and so
95 forth.

The sliding movements of the controller 45 on the shaft 31 are controlled by operating devices which comprise an upright arm 49, the lower end of which is bifurcated to
100 loosely engage in the grooved collar portion 45^a of the controller and the upper arm of which is provided with a hub 50 which is secured to the inner end of a slide rod 51 supported on the right-hand lug 32 and on
105 an additional lug 52 depending from the top plate. Slidable movements of the rod 51 are limited by stop collars 53 and 54 which coöperate with the sides of the lug 52. The outer or right-hand end of the slide rod 51
110 carries an upright pin 55 which is engaged by the forked arm of a bell crank 56 having a fixed pivot 57 and connected by a forwardly extending link 58 with a second bell crank 59 having a fixed pivot 60. The
115 bell crank 59 has a spring arm 61 which extends forward through a cut-away in the right-hand front plate 62 and is provided with a finger piece or key 63 and is formed with a tooth or depression 61^a which coöper-
120 ates with notches 64 in the top edge of the plate 62. The tooth 61^a and the notches 64 act as detent devices to maintain the spring arm 61 and the devices controlled thereby up to and including the link controller 45 in
125 set positions. Thus the controller may be slid along the driving shaft 31 transversely of the link 42 and may be held or set to

present any one of its operating faces to said link so that thereafter as the carriage is advanced for letter spacing and the driving shaft 31 is correspondingly rotated, the controller 45 will turn also, causing the engaged operative face to turn in contact with the link 42. The link is thus re-set at will so as to vary the ribbon vibrator devices. The parts thus far described are or may be of the construction commonly found in the Monarch machine.

In order to limit positively the upward movements of the vibrator so as to restrict the printing to predetermined fields of the ribbon, I provide stop devices which co-act with the operating lever, said stop devices being variable to correspond with variations in the ribbon actuating or throwing means and being automatically set by the printing keys, a preliminary operation of certain of the stop devices prior to the resetting of the stops proper being performed automatically by operation of the key 63 that controls the throw varying devices. The stop devices proper are supported on a frame or bracket 65 which, as appears in Fig. 1, is L-shaped in vertical cross section and is secured to the under side of the top plate in rear of the vibrator by screws 66, being formed with a vertical slot 67 to permit of the passage and operation of the lever 38. The front and rear parallel upright portions of the bracket 65 provide bearings for a rock shaft 68 which has secured near its forward end and behind the front vertical portion of said bracket a stop member 69. As best appears in Fig. 9 said stop member comprises upwardly extending slightly diverging arms 70 and 71 unequal in length, which at their tops are bent inward toward each other providing overhanging stops numbered respectively 72 and 73, these stops being directed to coöperate with the top edge of the operating lever 38 at different points in its path of travel and a short distance behind the vibrator. The operating lever vibrates up and down in the space between the stop arms 70 and 71. The lower end portion of the stop member 69 below the rock shaft 68 is provided with two notches 74 and 75 with which coöperate a spring detent 76 secured by a screw 77 to the bracket 65. The notches and coöperating spring detent 76 provide detent devices which maintain one or another of the stops 72 and 73 in operative position over and in the path of the operating lever 38.

The stops 72 and 73 are rendered operative by devices which automatically turn the rock shaft 68 to and fro, said devices comprising a rocking lever 78 which is secured to the rear end of the rock shaft 68 forward of the rear vertical portion of the bracket 65. The lever 78 is substantially horizon-

tally disposed and its oppositely disposed arms terminate in upright extensions 79 and 80. Actuating devices are provided for acting on these extensions to rock the shaft 68 back and forth and swing one or another of the stops 72 and 73 to operative position. Said devices comprise horizontally disposed fingers or actuators 81, 82 and 83 which are fixed to and extend forward from a slide bar 84. Said slide bar is horizontally disposed and its inner or left-hand portion is slidably supported in a bearing block 85 suitably fixed to the link 42 somewhat below the upper end thereof. The block 85 is formed with a vertical slot in which the slide bar 84 is seated, and with a connecting horizontal slot 86 which provides a passage for the actuators 81, 82 and 83 when the bar 84 is slid endwise. Said actuators are bent or off-set near the slide bar 84 so as to clear the lower front portion of the block 85 and register with the slot 86. By sliding endwise the bar 84 one or another of the actuators may be brought over the upward extensions on the lever 78 so that thereafter when the link 42 is lowered by one of the printing keys the stop carrier or rocker comprising the elements 78, 68 and 69 may be rocked or reset to reset the stops proper.

Endwise sliding movements of the stop controller, comprising the slide 84 and the actuators thereon, are obtained by connecting said controller with the slide rod 51. The right-hand end portion 87 of the bar 84 is bent upward and is provided with a vertical slot 88 which receives a pin 89 fixed to and extending horizontally forward from the hub 50. The construction is such that when the slide rod 51 is slid in and out by operating the key 63 the stop controller is correspondingly slid or moved endwise through the block 85 without moving the link 42 which supports the same; but when the link 42 is operated by the printing keys the stop controller will be carried bodily up and down with the link (with possibly, on occasion, a slight pivotal motion around the pin 89) transversely of the direction of the sliding movement of the controller 84, this bodily up and down movement being guided in part by the pin 89 but taking place independently of movement of said pin and the parts with which the same is connected. Also when the link 42 is swung fore and aft longitudinally of the operating lever the stop controller 84 will participate in this movement without variation in its relationship with the link, but this movement of the controller will move it lengthwise of and independently of the pin 89. The actuators on the controller are of such length that they will never be carried back of the plane of the lever 78.

Assuming that the parts are in the rela-

tionships shown in Figs. 1, 2, 3 and 9 it will be observed that the link 42 is engaged with the operating face 46 and that the stop 72 overlies the operating lever while the actuator 82 overlies the extension 80 on the lever 78. If now the space key or one of the printing keys be operated, it will depress the universal bar 14, pulling down the link 42, said link carrying bodily with it the slide bar 84, causing the actuator 82 to push down on the extension 80, rocking the lever 78 and through it the rock shaft 68 and the stop member 69 to the position shown in Fig. 4, in which position the stop carrier or rocker comprising the stop member 69 and the lever 78 will be held or maintained by the spring detent 76 and the cooperating notch 74, said detent riding out of the notch 75 and into the notch 74. This swing of the stop carrier from the Fig. 3 to the Fig. 4 position carries the lower stop 72 out of operation and swings the upper stop 73 into the path of the advancing operating lever 38, which lever will be arrested in its upward swing after it has moved the vibrator upward to present the lower ribbon field *b* to the action of the types. The stop 73 positively arrests the operating lever and vibrator so that overthrow of the ribbon is prevented. It will be understood that the stop 73 will remain set in the operative or Fig. 4 position during and unaffected by subsequent operations of the printing keys, until it may be desired to change ribbon fields. Suppose it be desired to shift from the lower ribbon field to the upper ribbon field *a*, the operator pushes the key or finger piece 63 leftward until the lever arm 61 reaches the dotted line position *y* in Fig. 2, in which position the lever arm will be arrested by the tooth 61^a cooperating with the middle notch 64. During this movement of the key and lever arm the connected parts will move correspondingly and the bell crank 56 will move the slide rod 51 inward until the link controller 45 has been slid along the shaft 31 to bring the operating face 47 into cooperation with the link 42, said link being thereby reset so that the stud 41 will be at the rear end of the slot 40 in position to communicate the least extent of throw to the operating lever and vibrator. During this sliding movement of the link controller 45, the pin 89 will act on the stop controller 84 to slide the same inward on its bearing block 85 and to reset it in the position shown in Fig. 5. This movement of the stop controller moves the actuator 82 out of register with the extension 80 and brings the actuator 81 directly over or in register with the arm or extension 79, so that if now a printing key be depressed the link 42 moving downward will cause the actuator 81 to operate on the extension 79

to reset the stop carrier or rocker in the Fig. 6 position, swinging the stop 72 into the path of the upwardly moving operating lever 38. The result will be that when the operating lever has been swung up so that the vibrator will present the upper field *a* to the types, said operating lever and vibrator will be arrested positively by the stop 72, thus confining the printing to the ribbon field *a* and preventing overthrow.

Whenever it may be desired to make use of the ribbon cross feeding mechanism, as when a plain or uniform ribbon is to be used, the finger piece 63 is pushed leftward to reset the arm 61 in the dotted line position indicated by the letter *z* in Fig. 2, the train of connected devices operating to slide the link controller 45 inward and reset it so that the eccentric operating face 48 is in engagement with the link 42. This resetting of the link controller 45 operates through the pin 89 to reset the slide bar 84 in the Fig. 7 position from which it will be observed that the actuator 83 has been brought over the extension or lug 80 so that when the next printing key is operated the stop carrier or rocking frame will be reset in the Fig. 8 position, bringing the stop 73 into the path of the operating lever 38. It will be borne in mind that the stop 73 limits the extreme upward movement of the operating lever, and consequently the progressively increasing and decreasing movements communicated to the operating lever due to the variable action of the eccentric face 48 on the link 42 will not be interfered with.

The series of operations above described may, of course, be reversed and in fact the mechanism may be set at any time in any one of its operative positions to bring about desired results.

By my present invention it will be seen that I provide ribbon vibrating or actuating devices variable or settable to vibrate the ribbon different extents and ribbon stop devices which are automatically variable by a different operation from that by which the vibrating devices are varied, the stops being thus varied to correspond with the variation in the extent of the vibrating or throwing of the ribbon; that in the present instance the stop devices are automatically variable by the spacing mechanism, the printing mechanism and the ribbon mechanism, and so far as my invention broadly considered is concerned any key or finger piece may be employed to cause a shifting of the ribbon stops as long as the said key or finger piece is connected to either the printing or spacing mechanism, whereby the stops are automatically shifted, not by adjusting the ribbon throw varying means, but by an operation connected with the printing or spac-

ing; that the stop mechanism comprises a stop controller or setting devices which are variably set independently of the stops proper, these latter being on a stop carrier adapted to rock or rotate back and forth when the settable stop controller is operated by the first printing key which may be depressed after the resetting of said stop controller; that the work of resetting the stop is done by the first printing key, and that the actuation of subsequent printing keys does not affect the stops, it being necessary to reset the controller before a printing key will again become effective to reset the stops; that in the present instance the stop controller 84 is settable by hand through the same train of mechanism which operates to reset the ribbon vibrating mechanism to vary the throw of the ribbon; that the particular vibrating device which is reset in the present instance is a link 42; that said link provides a support for the stop controller which is bodily movable with the link at printing operation but is settable to vary its normal relationship with the link; and that this variation in normal relationship is effected independently of the stop carrier and also of the ribbon carrier or vibrator.

Various changes may be made without departing from the spirit and scope of my invention.

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

1. In a typewriting machine, the combination of variable ribbon vibrating devices, and key actuated ribbon stop devices automatically adjustable during the operation of the machine, the variable action of the vibrating devices being independent of the arrest of the ribbon by the stop devices.

2. In a typewriting machine, the combination of printing keys, variable ribbon vibrating devices, and ribbon stop means including devices automatically settable by the operation of the printing keys.

3. In a typewriting machine, the combination of printing keys, variable ribbon vibrating devices, ribbon stop devices, and means for resetting the stop devices to vary their action on the ribbon, said means including devices operative by the printing keys.

4. In a typewriting machine, the combination of a ribbon vibrator, vibrating means therefor, hand controlled means for varying said vibrating means, settable ribbon stop devices, actuating devices for said stop devices, said actuating devices being settable by said hand operated means, and automatic means for operating said actuating devices to reset said stop devices.

5. In a typewriting machine, the combination of a ribbon vibrator, vibrating means

therefor, hand controlled means for varying said vibrating means, settable ribbon stop devices, actuating devices for said stop devices, said actuating devices being settable by said hand operated means, printing keys, and means controlled by said printing keys for operating said actuating devices to reset said stop devices.

6. In a typewriting machine, the combination of a ribbon vibrator, variable actuating means therefor, a settable ribbon stop carrier, variable resetting devices for said carrier, and means for varying said devices and for actuating said devices to reset said carrier.

7. In a typewriting machine, the combination of a ribbon vibrator, variable vibrating means therefor, a settable ribbon stop carrier, settable devices for resetting said carrier, means for resetting said devices, and means for actuating said devices to reset said carrier after the devices themselves have been reset.

8. In a typewriting machine, the combination of printing keys, a ribbon vibrator, variable actuating means for said vibrator, ribbon stop mechanism comprising a settable stop carrier and variable resetting devices therefor, means for varying said devices, and means controlled by the printing keys for actuating said devices to reset said carrier.

9. In a typewriting machine, the combination of a ribbon vibrator, variable actuating means therefor, ribbon stop mechanism comprising a settable stop carrier, and variable resetting devices therefor; means for varying said devices independently of said carrier; and means for actuating said devices to reset said carrier.

10. In a typewriting machine, the combination of printing keys; a ribbon vibrator; variable vibrating devices for said vibrator; ribbon stop mechanism comprising a settable stop carrier, and variable devices for resetting the same; means for varying said devices independently of said carrier; and key-operated means for actuating said devices to reset said carrier.

11. In a typewriting machine, the combination of a ribbon vibrator; vibrating means therefor; hand controlled means for varying said vibrating means; ribbon stop mechanism comprising a settable stop carrier and variable devices for resetting the same; automatic means for varying said devices independently of said stop carrier; and means for actuating said devices to reset said carrier.

12. In a typewriting machine, the combination of a ribbon vibrator, vibrating means therefor, hand controlled means for varying said vibrating means, ribbon stop mechanism comprising a settable stop carrier and variable devices for resetting the same, means

connected to said hand controlled means for varying said devices independently of said carrier, and means for actuating said devices to reset said carrier.

- 5 13. In a typewriting machine, the combination of printing keys; a ribbon vibrator; vibrating means for said vibrator; hand controlled means for varying said vibrating means; ribbon stop mechanism comprising a
10 settable stop carrier, and variable devices for resetting the same; means automatically operative by said hand controlled means for
15 variably setting said devices independently of said stop carrier; and means automatically operated by the printing keys for actuating said devices after they have been
reset.
14. In a typewriting machine, the combination of a ribbon vibrator; vibrating devices for the same; hand controlled means
20 for varying the normal relationship of said vibrating devices; ribbon stop mechanism comprising a settable stop carrier, and variable resetting devices for said carrier supported on certain of said vibrating devices;
25 and means for varying the normal relationship between said resetting devices and their support.
15. In a typewriting machine, the combination of a ribbon vibrator; vibrating devices for the same; hand controlled mechanism for varying the normal relationship of
30 said vibrating devices; ribbon stop mechanism comprising a settable stop carrier, and variable resetting devices for said carrier supported on certain of said vibrating devices;
35 and means connected with said hand controlled mechanism and automatically operative thereby for changing the normal relationship between said resetting devices and
40 said vibrating devices.
16. In a typewriting machine, the combination of a ribbon vibrator; variable vibrating devices for the same; ribbon stop mechanism comprising a settable stop carrier, and
45 variable resetting devices for said carrier; and means for changing the normal relationship between said resetting devices and said vibrating devices independently of said carrier.
50 rier.
17. In a typewriting machine, the combination of printing keys; variable ribbon vibrating devices; ribbon stop mechanism comprising a settable stop carrier and variable
55 resetting devices for said carrier; means for changing the normal relationship between said resetting devices and said vibrating devices independently of said carrier; and means controlled by the printing keys to
60 actuate said resetting devices to reset said stop carrier so as to change its normal relationship with said ribbon vibrating devices.
18. In a typewriting machine, the combination of a ribbon vibrator, vibrating de-

vices, ribbon stops, a stop controller carried 65 by certain of said devices, and means for varying the normal relationship between said stop controller and said devices.

19. In a typewriting machine, the combination of ribbon vibrating devices, ribbon 70 stops, a plurality of stop actuators, hand controlled means for bringing predetermined stop actuators into operative position, and means for operating said actuators.

20. In a typewriting machine, the combination of variable ribbon vibrating devices, 75 ribbon stops, a plurality of stop actuators supported on one of said vibrating devices, and means for moving said stop actuators into operative position and for simultaneously resetting the vibrating device on 80 which said actuators are supported.

21. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, an actuating link, ribbon stops, a plurality of actuators supported on said link 85 for resetting said stops, and means for simultaneously resetting said link and said actuators.

22. In a typewriting machine, the combination of a ribbon vibrator, actuating means 90 therefor including a device connected to said vibrator, and a second device for actuating the first device, variably settable stops directly coöperative with said first device, and 95 means for varying the action of said second device on said first device to vary the throw of the ribbon, said stops remaining quiescent during the actuation of said last named means. 100

23. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, a key controlled actuating link for said lever, an oscillatory stop carrier having stops coöperative with said lever, and means 105 mounted on and controlled by said link for oscillating said stop carrier.

24. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, a key controlled actuating link, an oscillatory stop carrier having stops coöperative with said lever, settable means on said link for turning said stop carrier back and forth, and means for varying the normal position of said settable means. 115

25. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, a key controlled actuating link, a rocking stop carrier, settable actuators on said link for rocking said carrier, means for resetting said link to vary the throw of the ribbon, and means connected with the last recited means for resetting said actuators. 120

26. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, a key controlled actuating link, means 125 for resetting said link to vary the throw of the ribbon, a stop rocker, a bar slidable on

said link and provided with a plurality of actuators for rocking said rocker, and means for resetting said slidable bar.

27. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, a key controlled actuating link, means for resetting said link to vary the throw of the ribbon, a stop rocker, a bar slidable on said link and provided with a plurality of actuators for rocking said rocker, and means for resetting said slidable bar, said last named means being connected to the means for resetting said link.

28. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means for varying the throw of said lever, a pair of stops arranged at different elevations and adapted directly to arrest the movements of said lever according to adjustment of said stops, and means operating independently of the throw-varying means for moving said stops, said independently operating means being actuated by some working part of the machine.

29. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means for varying the throw of said lever, a pair of stops, one to engage said lever and arrest it for one throw and the other to engage said lever and arrest it for a different throw, means for automatically adjusting said stops with reference to said lever, said means including devices connected with and operated by the writing mechanism.

30. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means for varying the throw of said lever, a pair of stops to arrest said lever variably according to adjustment of the throwing means, key operated means for actuating said operating lever, and means including devices between said key-operated means and said stops for adjusting said stops by the operation of said key-operated means.

31. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means for varying the throw of said lever, a pair of stops to arrest said lever variably according to adjustment of the throwing means, key operated means for actuating said operating lever, an adjustable controller connected to said key operated means, and means including devices between said controller and said stops for adjusting said stops by the operation of said key operated means.

32. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means for varying the throw of said lever, a pair of stops to arrest said lever variably according to adjustment of the throwing means, key operated means for actuating said operating lever, a plurality of

setting devices connected to said key operated means and movable therewith, and devices connected to said stops upon which said setting devices are adapted to act to adjust said stops during a stroke of the key operated means for actuating the operating lever.

33. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means for varying the throw of said lever, a pair of stops to arrest said lever variably according to adjustment of the throwing means, key operated means for actuating said operating lever, said means including a slide automatically adjustable by said throw-varying means, means connected with said stops, and means on said slide adapted to co-act with said means connected with said stops so as to change the adjustment of said stops upon a stroke of said key operated means connected with the operating lever.

34. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means for varying the throw of said lever, a pair of stops to arrest said lever variably according to adjustment of the throwing means, key operated means for actuating said operating lever, said means including a link, a slide supported on said link to reciprocate therewith and also adapted to be automatically adjusted transversely thereof when said throw-varying means is operated, a plurality of projections on said slide, and a plurality of rocker arms connected with said stops.

35. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means for varying the throw of said lever, a pair of stops to arrest said lever variably, a slide connected to the throw varying means, a link to which said slide is adjustably attached, said link being connected with said operating lever, a plurality of actuators on said slide, a rock shaft connected with said stops, and a plurality of rocker arms attached to said rock shaft.

36. In a typewriting machine, the combination of ribbon vibrating mechanism, stops for variably limiting the throw of the ribbon, and means for setting said stops comprising devices controlled by the operation of the ribbon vibrating mechanism.

37. In a typewriting machine, the combination of ribbon vibrating mechanism, stops for variably limiting the throw of the ribbon, a hand adjusted actuating device connected to said vibrating mechanism, and means connected with said stops adapted to be operated by said hand adjusted device at a working stroke of said ribbon vibrating mechanism.

38. In a typewriting machine, the combination of ribbon vibrating mechanism, stops for variably limiting the throw of the

ribbon, duplex means connected with said stops and adapted to be alternately acted upon, and an adjustable hand operated controller provided with devices to act upon
5 said duplex means, said controller being connected to said ribbon vibrating mechanism; whereby after adjustment of said controller said stops are actuated thereby upon the
10 first working stroke of the ribbon vibrating mechanism.

39. In a typewriting machine, the combination of ribbon vibrating mechanism, hand actuated settable devices connected

therewith, automatically adjustable stops for the ribbon, and means between said stops and said settable devices for causing adjustment of said stops during an operation of said ribbon vibrating mechanism.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 21st day of February, A. D. 1911.

JACOB FELBEL.

Witnesses:

CHARLES E. SMITH,
L. NELSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."