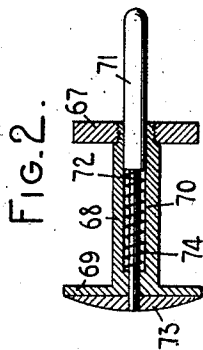


1,002,939.

3 SHEETS--SHEET 1.



M. F. Hannuchen
m.w. Pool

Herbert H. Steele
By Jacob Falck

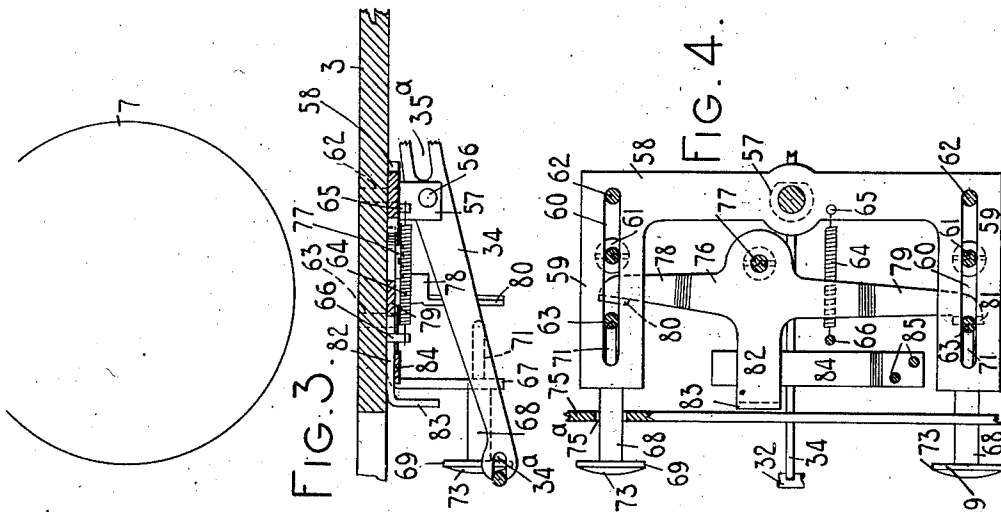
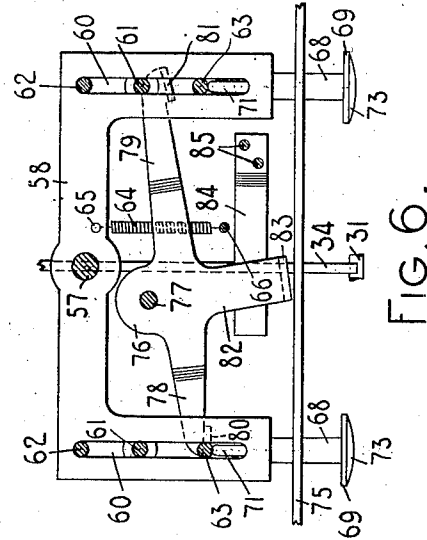
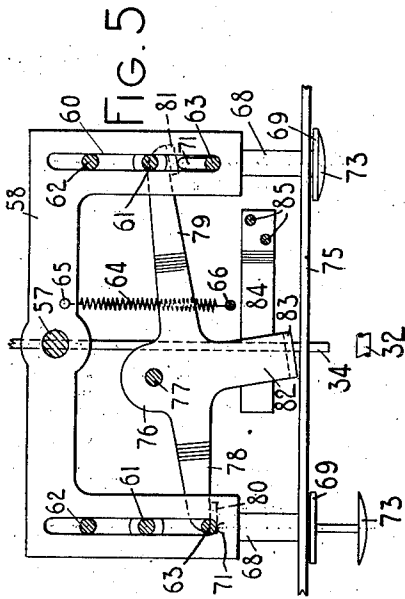
HIS ATTORNEY

H. H. STEELE.
TYPE WRITING MACHINE.
APPLICATION FILED AUG. 17, 1910.

1,002,939.

Patented Sept. 12, 1911.

3 SHEETS—SHEET 2.



WITNESSES:

M. F. Hannacher
M. W. Pool

INVENTOR:

Herbert H. Steele
By Jacob Felbel

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3 SHEETS—SHEET 3.

FIG. 7.

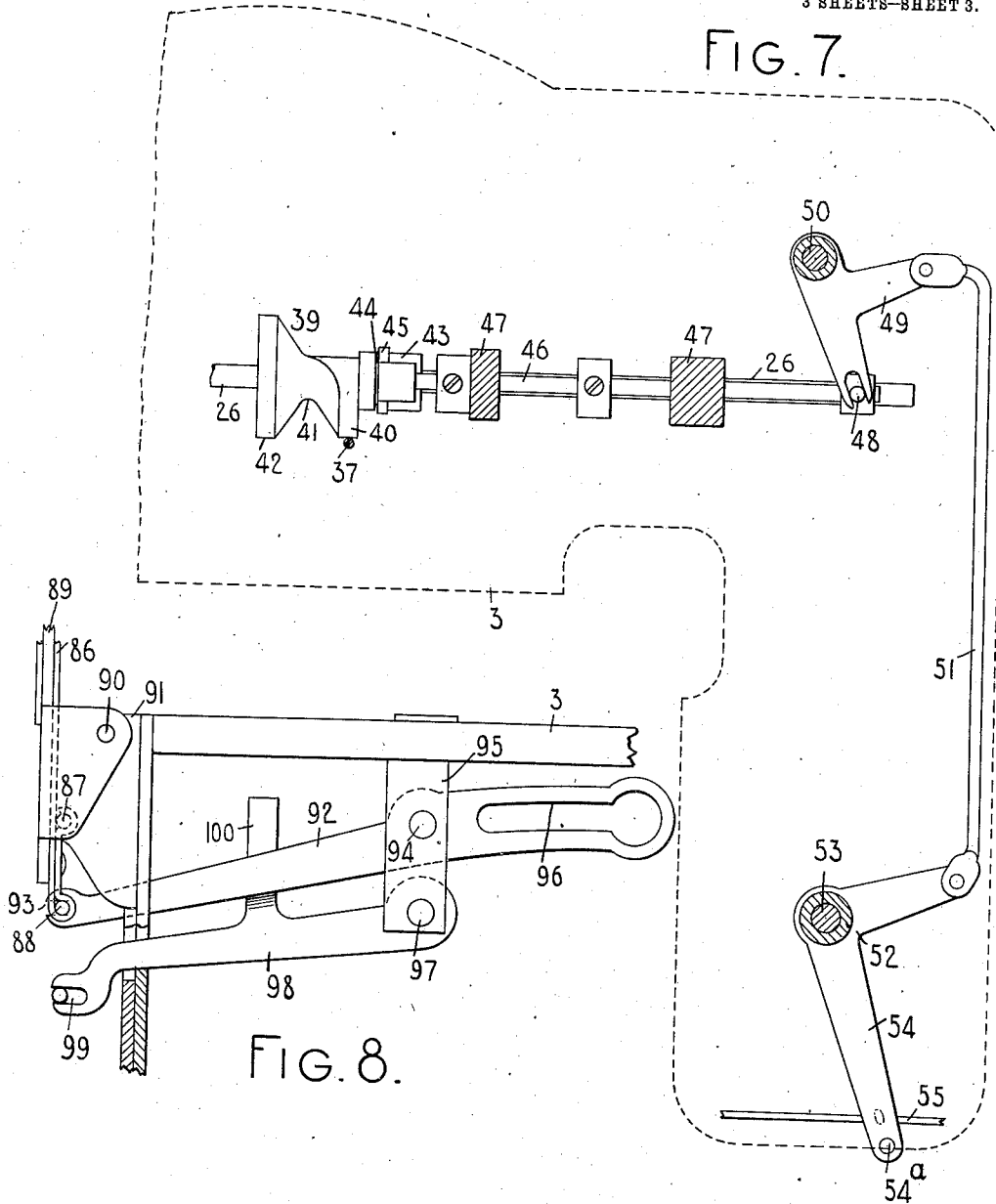


FIG. 8.

WITNESSES:

M. F. Hannacher

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INVENTOR:

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By Jacob Felber

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UNITED STATES PATENT OFFICE.

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

TYPE-WRITING MACHINE.

1,002,939.

Specification of Letters Patent.

Patented Sept. 12, 1911.

Application filed August 17, 1910. Serial No. 577,575.

To all whom it may concern:

Be it known that I, HERBERT H. STEELE, a 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 mechanism for type-writing machines and has for its object the provision of improved mechanism of the character stated.

More specifically, one object of my invention is to provide improved devices whereby the use of the ribbon may be dispensed with at will, whenever it is desired to write a stencil or mimeograph sheet or for any other purpose.

Another object is to provide improved means for using the ribbon variably.

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.

My invention may be adapted to various kinds of writing machines but I have preferred to show it as applied to a Monarch typewriter.

In lieu of the usual vibrator having a single cross pin I provide a vibrator having two cross pins or points of connection for the operating lever. Said operating lever is supported on a spring pressed slidable frame which may be moved back and forth to enable the operating lever to be connected with one or another of the cross pins on the vibrator. The operating lever is adapted to be variably actuated. When it is connected with the upper cross pin on the vibrator, it is adapted to lift the vibrator at printing operation to some extent but not far enough to bring any portion of the width of the ribbon opposite the printing point. Consequently the types will co-act directly with the stencil or other work sheet. Under another and greater actuation the operating lever when connected with the upper cross pin would, if not prevented, throw the vibrator far enough to present the ribbon to the types, but I provide a stop adapted to co-act with the operating lever to prevent the vibrator from being thrown far enough to bring the ribbon into the path of the types, this stop being preferably connected

with the slidable frame which carries the operating lever and being automatically actuated when said frame is actuated. When the operating lever is connected with the lower cross pin of the vibrator it will always throw said vibrator at printing operation far enough to present the ribbon to the types, the particular widthwise portion of the ribbon presented depending on the relationship existing at the time between the operating lever and its variable actuating devices.

My invention will be more specifically described in connection with the accompanying drawings wherein—

Figure 1 is a vertical front to rear sectional view of a Monarch typewriting machine embodying my invention, only so much of said machine being shown as is necessary to a clear understanding of said invention. Figure 2 is a longitudinal sectional view of a part hereinafter termed a spring plunger, and its mounting. Figure 3 is a fragmentary vertical sectional view showing more particularly the operating lever, the slidable frame supporting the same and the connected stop, the relative positions corresponding with those of Fig. 1. Figure 4 is a plan view, partly in section, showing the operating lever, the slidable frame or support therefor and the connected stop in the same relationship as in Fig. 3. Figs. 5 and 6 are views corresponding with Fig. 4 but showing different relations of the parts. Figure 7 is a plan view partly in section of the manual devices for controlling the variable actuating mechanism for the operating lever. Figure 8 is a vertical side view, partly in section, of a modification.

Referring to Fig. 1, the main frame of the machine comprises a base portion 1 from which rise posts 2 supporting a top plate 3. Key levers 4 are fulcrumed on a plate 5 located within the base at the rear thereof. Each key lever is provided with a restoring spring 6 and is connected in the usual or any suitable way with a type bar (not shown) having the usual or any suitable construction and mounting. The type bars when actuated are adapted to swing upward and rearward and to cooperate with the front of a roller platen 7 diagrammatically illustrated herein. The platen is mounted on a carriage (not shown) to which it is connected by a band 8 on the spring drum 9.

Letter space movements of the carriage are controlled by escapement devices comprising a toothed escapement member 10 and feed dogs 11 and 12, which dogs are supported at the top of a pivoted rocker 13, the horizontal arm whereof is connected by a vertical link 14 with a central arm 15 of a universal bar frame pivoted at 16 in the sides of the base 1, said frame carrying a universal bar 17 which underlies the key levers 4.

A ribbon 18 is wound on horizontal spools 19 one at each side of the machine above the top plate and forward of the platen. Each spool is supported on a vertical shaft 20 which carries at its lower end a beveled pinion 21 meshing with a beveled pinion 22 carried at the forward end of a horizontal shaft 23 bearing in stationary lugs 24 and having fixed at its rear end a beveled pinion 25. The two pinions 25 are adapted to mesh alternately with associate driving pinions secured on a power or driving shaft 26. Said shaft receives rotary motion from the spring drum 9 when the latter turns to draw the carriage in printing direction, the connection between the spring drum and the power shaft comprising intermeshing pinions 27 and 28.

The spool turning or ribbon feeding mechanism above briefly described is like that of the Monarch typewriting machine but any other suitable ribbon feeding mechanism may be employed if desired.

Midway between the ribbon spools the ribbon is threaded through a vibratory ribbon carrier or vibrator 30 which may be of any suitable construction but is of the usual construction, as shown in Fig. 1, except that instead of a single cross pin the stem of the vibrator is provided with two cross pins 31 and 32 arranged one above the other and about $\frac{1}{8}$ " apart. The vibrator is adapted to be vibrated up and down on a stationary, vertical guide 33 by suitable devices including a member or operating lever 34, the forward end whereof is slotted, as indicated at 34^a, to cooperate with the cross pins 31 and 32. The mounting of the operating lever 34 is of novel construction and will presently be described in detail. The rear arm of said operating lever is connected with actuating devices, being formed longitudinally with a slot 35 which receives an actuating pin 36 projecting laterally from the top of a link 37, said link extending downward and being pivotally connected at its lower end with the arm 15 of the universal bar frame.

It will be understood that when a key lever 4 is actuated the universal bar frame will be swung downward, lowering the link 37 and causing it to swing the operating lever 34 to raise the ribbon carrier and the printing portion of the ribbon. It will be further understood that the extent of move-

ment of the ribbon carrier may be varied by varying the actuating devices, this being accomplished by swinging the link 37 about its pivotal connection with the arm 15, thus changing the position of the actuating pin 36 in the slot 35. A draw spring 38 connects the links 14 and 37 and tends constantly to swing the link 37 rearward about its pivot. The movements of the link 37 are controlled by a member 39 (Figs. 1 and 7) which is slidably mounted on the power shaft 26 and is connected to receive rotary movement from said shaft. The member 39 comprises three working faces 40, 41 and 42 which are connected by cam surfaces. The faces 41 and 42 are different in diameter but are both concentric with the shaft 26 while the face 40 is eccentric thereto. A hub 43 extends rightward from the member 39 and is formed with a circumferential groove 44 which is loosely engaged by a vertical forked arm 45 fixed to the left-hand end of a slide rod 46. Said slide rod is supported on stationary lugs 47 which also provide bearings for the shaft 26. Fixed to the right-hand end of the rod 46 is a pin 48 which is engaged by the slotted arm of a bell crank lever 49 having a fixed fulcrum 50. A link 51 extending forward beneath the top plate connects the other arm of the bell crank 49 with an arm of a second bell crank 52 which is pivoted at 53 to the under side of the top plate near the front of the machine and has an arm 54 extending forward through a slot in the right-hand front plate 55. The forward end of the arm 54 is provided with a finger piece 54^a by which the bell crank 52 may be swung on its pivot, thereby operating through the described connections to slide the rod 46 back and forth in its bearings and vary the position of the member 39 lengthwise of the power shaft 26, thus bringing one or another of the working faces 40, 41 and 42 into cooperation with the link 37.

As is well understood, the eccentric face 40 is employed when a uniform ribbon is in use so as to vary automatically and progressively the throw of the ribbon carrier and obtain a crosswise feeding of the ribbon at the same time that it is fed lengthwise. In the drawing a two-color ribbon 18 is illustrated, said ribbon being divided lengthwise into fields *a* and *b* which may, for example, be respectively black and red. With such a ribbon it is usual to set the actuating devices in predetermined relationships by employing the faces 41 and 42. When the working face 42 is in operation the link 37 will be maintained normally in the full line position of Fig. 1, the pin 36 engaging the slot 35 near the fulcrum of the operating lever. If at this time the lower cross pin 32 is engaged with the operating lever 34, then the printing portion of the ribbon will be normally maintained in the Fig. 1 position and at

printing operation will be lifted so as to present the lower field *b* opposite the printing point *p* on the platen. As long as the actuating link is normally held set by the face 42 the ribbon will always be thrown so as to present the lower field *b* to the types. The positioning member may be shifted by manipulating the finger piece 54^a so as to bring the working face 41 into use and then the link 37 will be drawn back by the spring 38 to the dotted line position in Fig. 1 and at printing operation the vibrator will be lifted only far enough to present the upper field *a* to the types. It will be observed that as thus far described the operation does not differ materially from that of other two-color ribbon mechanisms heretofore known.

In order to provide for the ready connection and disconnection of the operating lever with the cross pins 31 and 32, said lever and its fulcrum are slidably mounted. The fulcrum pin 56 of the lever 34 is supported on a block 57 which is fixed to a slidable U-shaped frame or member 58 and projects down from the central portion of the body thereof. Extending forward from the ends of the body of the frame 58 are parallel end arms 59 (Figs. 4 to 6) which are formed with longitudinal slots 60. Said slots receive headed screws 61 threaded into the under side of the top plate and serving to slidably support the frame 58 against the under side of said top plate. Pairs of pins 62 and 63 arranged at opposite sides of the screw 61 limit the back and forth sliding movements of the plate or slidable member 58. A draw spring 64 is connected at one end to a pin 65 on the frame 58 and at the opposite end to a stationary pin 66 depending from the top plate. Said draw spring constantly tends to pull the frame 58 forward and normally maintains the rear ends of the slots 60 in engagement with the limiting or stop pins 62. When in normal position the frame 58 maintains the operating lever 34 so that it will engage with the vibrator through one of the cross pins. When the frame 58 is slid rearward against the spring 64 said frame carries with it the operating lever 34 which disengages from the vibrator and enables the latter to be shifted up and down or re-adjusted so that when the frame 58 is permitted to slide back to normal position the operating lever will engage with the other cross pin on the vibrator.

The means for manually controlling the sliding movements of the frame 58 comprise devices which are shown in detail in Fig. 2, and will now be described. The end arms 59 terminate at their forward ends in downward vertical extensions 67 into each of which is screwed a socket or bearing 68 extending horizontally forward and terminating in a flange 69. The bearing 68 is

bored out as indicated at 70, the bore having a rear opening and receiving a plunger 71. The stem 72 of the plunger extends forward through a hole in the bottom of the bore and projects beyond the forward face of the flange 69, receiving a cap or finger piece 73. A coiled spring 74 surrounds the stem of the plunger and constantly presses said plunger rearward, normally maintaining the finger piece 73 in contact with the flange 69, as shown in Fig. 2. It will be seen that the bearing members 68 are integral with the frame 58 and that when the finger pieces 73 are against the flanges, as shown in Figs. 2 and 4, then pressure applied to either finger piece will cause rearward movement of the frame. The bearing members 68 pass through slots 75^a in the front plate 75, as shown in Fig. 4, so that the back and forth movements of the frame 58 and bearing members 68 are not obstructed. The plungers 71 are adapted to cooperate with a three-armed lever 76 pivoted at 77 to the under side of the top plate forward and somewhat to the left of the position normally occupied by the fulcrum block 57. The lever 76 comprises laterally extending arms 78 and 79, the arm 78 being formed at its end with a downward extension 80 which lies in the path of the left-hand plunger 71 while the arm 79 is formed with a similar extension 81 in the path of the right-hand plunger. The third arm 82 of the three-arm lever extends forward and terminates in a downward extension 83 which is adapted to cooperate with the upper edge of the forward arm of the lever 34, serving as a stop to limit upward movement thereof. A flat spring 84 is secured at 85 to the under side of the top plate and underlies the arm 82 which it frictionally engages. The function of this spring is to maintain the three-armed lever in the positions to which it may be swung back and forth under the action of the plungers 71.

Suppose that the parts are in the relationships shown in Figs. 1, 2 and 3 and that it be desired to dispense with the use of the ribbon for the purpose of writing a stencil sheet or for some other purpose, the operator first presses the right-hand finger piece 73. By reference to Fig. 4 it will be noted that at the beginning of the operation the right-hand plunger 71 is in contact with the extension 81 on the lever 76 and that the stop 83 is out of the path of the lever 34 and consequently in inoperative position. As the finger piece 73 is pressed in the frame 58 is slid rearward, carrying with it the operating lever 34 and at the same time the three-armed lever 76 is swung on its pivot 77, moving the stop 83 over and into the path of the operating lever 34 and swinging the extension 80 against the left-hand

plunger 71. As soon as contact between the extension 80 and the associate plunger takes place, rearward movement of said plunger is arrested and it is forced forward in its bearing and compresses its spring 74, causing the finger piece 73 to move forward away from the associate flange 69 which at the same time continues to move rearward along with the frame 58 until the same is arrested by the stops 63 engaging the forward ends of the slots 60. At this time the parts will be in the position shown in Fig. 5, from which it will be observed that the operating lever 34 has been disconnected from the cross pin 32. Consequently the vibrator may be lowered until the cross pin 31 is opposite the slot 34^a of the lever, after which the right-hand finger piece 73 may be released, permitting the spring 64 to restore the frame 58 and the operating lever to normal position, the slot 34^a of said lever now being engaged with the cross pin 31, thus giving it a new point of connection with the vibrator and lowering the normal position of the latter. During the return of the frame 58 and operating lever to normal position the three-armed lever 76 will not be affected but will be maintained in the Fig. 5 position by the friction spring 84. As the frame 58 moves forward it carries with it the left-hand bearing 68 but does not affect the associate spring plunger 71, although the spring of said plunger gradually expands until the flange 69 reengages with the button or finger piece 73. When the parts are re-arrested by the stop 62 they will be in the normal position shown in Fig. 6. It will be understood that during the movement of the parts from the Fig. 1 to the Fig. 5 position and back from the Fig. 5 position to the Fig. 6 position, the link 37 will not be affected. In order to prevent obstruction of the rearward movement of the lever 34 by the actuating pin 36 the slot 35 is extended forward as indicated at 35^a, said extension moving back relatively to the actuating pin when the frame 58 is pushed in or rearward. It will be seen that the operating lever has a single normal position while the vibrator has two normal positions; further, that the change in normal relationship between vibrator and operating lever is effected independently of the link 37 and other actuating devices. If now any printing key be operated the lever 34 will receive its greatest extent of movement, since the link 37 is in its forward position; but the upward movement of said lever will be limited by the stop 83 which will arrest the lever and vibrator before the printing portion of the ribbon has reached the printing point. In the present instance, the arrest of the lever 34 checks the downward movement of the link 37 and universal bar 17 and limits the depression of the key

lever so that the same is prevented from throwing the associate type bar far enough to the printing point, although of course the parts may be so proportioned and adjusted that the type bars will not be arrested. The operator being thus notified that the stop 83 is in operation, must restore the stop member or three-armed lever 76 to the Fig. 4 position where said stop is inoperative. This is accomplished by pressing in the left-hand key or finger piece 73 to the limit of its rearward movement and then letting go, permitting the parts to be restored by the spring 64. As a preliminary, however, to re-setting the stop 83 in inoperative position, the operator must readjust the positioning member 39 by manipulating the finger piece 54^a so as to bring the operating face 41 into the plane in which the link 37 swings, thus permitting the draw spring 38 to draw said link back to the rear of the slot 35 as shown by the dotted line in Fig. 1. The parts are so proportioned that when thus set the link 37 lifts the vibrator and printing portion of the ribbon to some extent but not far enough to bring the ribbon opposite the printing point, the result being that the types, when actuated, will strike over the top edge of the ribbon and will contact directly with the stencil sheet or other work sheet.

It will be noted that the mechanism including the stop 83 and associate parts constitutes safety devices which insure that the ribbon cannot be lifted to the printing point by the actuating devices when the vibrator is normally set in its lowermost position with the operating lever 34 connected therewith at the upper connecting point or cross pin 31. Of course, it will be apparent that if prior to the disconnection of the cross pin 32, the link 37 were at the rear of the slot 35 there would be no need of employing the stop 83. The spring plungers provide connections between the frame 58 and the three-armed stop member whereby the stop member is automatically moved, set or operated when the frame is operated to disconnect the operating lever from the vibrator, said frame constituting means for changing the relationship between said vibrator and its operating lever.

Various changes may be made in my invention and parts of the same may be used without other parts, all without departing from the scope of said invention. An example of such changes is shown in Fig. 8 wherein the vibrator 86 is provided as before with two cross pins 87 and 88, but instead of being mounted on a fixed guide, said vibrator coöperates with a pivoted guide such as is shown in my pending application Serial No. 571,150, filed July 9th, 1910. The movable part 89 of said guide is pivotally supported at 90 to the fixed part

91 of said guide and is adapted to be swung on said pivot 90 so that the ready disengagement of one cross pin and the engagement of the other cross pin with the operating lever may be effected. The operating lever 92 has a slot 93 at its forward end to engage with the cross pins. Said lever is fulcrumed at 94 to a lug or post 95 fixed to and depending from the top plate 3. The rear arm of the lever 92 is formed with a slot 96 for engagement with the actuating link (not shown). The post 95 is extended downward below the lever 92 and has fulcrumed to its lower end at 97 a stop lever 98 which extends forward below the lever 92 and is provided at its forward end with a slotted opening 99 which is at the same distance normally below the slot 93, as is the distance between the cross pins 87 and 88, namely, about $\frac{1}{16}$ ". The lever 98 is provided with an upward extension 100 offset laterally so as not to interfere with the lever 92. The upper end of the extension 100 is adapted to co-act with the under side of the top plate 3 and serves as a limiting stop.

When related as in Fig. 8 with the lower cross pin 88 engaging the slot 93, the parts will operate during the printing movements as in the ordinary construction, the stop lever 98 remaining inoperative. When, however, the vibrator 86 and the guide part 89 are swung about the pivot 90 to disengage the pin 88 from the slot 93 and reengage the pin 87 with said slot, the pin 88 will engage the slot 99, thus connecting the levers 98 and 92 to the vibrator. The result will be that through the actuation of the printing keys the lever 98 will be swung upward and if the actuating link is adjusted to throw the lever 92 far enough to present the ribbon to the types, then the stop 100 will contact with the top plate and will arrest the vibrator before the ribbon has been moved into the printing field. If the operating lever 92 receives a less extent of movement from the actuating link, such that it will not lift the ribbon into the printing field even if not prevented, then the stop 100 will not come into play. In other words, said stop is proportioned and arranged so that it will only come into action when without it the ribbon would be presented to the types.

Various other changes may be effected without departing from my invention.

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

1. In a typewriting machine, the combination of a ribbon vibrator, an operating lever connected normally directly therewith, actuating devices for said lever, and means for shifting said operating lever bodily at will to disengage it from said vibrator.

2. In a typewriting machine, the combination of a ribbon vibrator, an operating lever connected normally directly therewith,

actuating devices therefor, and means for shifting said operating lever bodily at will to disengage it from said vibrator, the shifting movement of said operating lever being independent of said actuating devices.

3. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, said vibrator and said lever being connectible at any one of a plurality of points, actuating devices for said operating lever, and means for moving said lever at will independently of said actuating devices to enable it to be connected with said vibrator at any selected one of the connecting points.

4. In a typewriting machine, the combination of a ribbon vibrator, an operating lever having one arm connectible with said vibrator, actuating devices connected with the other arm of said lever, a movable fulcrum for said lever, and means for moving said fulcrum independently of said actuating devices so that the relationship between said vibrator and said lever may be varied.

5. In a typewriting machine, the combination of a ribbon vibrator having a plurality of cross pins, a slotted operating lever engageable with said cross pins, actuating devices for said lever including a link, a movable fulcrum for said lever, and means for moving said fulcrum at will independently of said link to enable said lever to be connected with one or another of said cross pins.

6. In a typewriting machine, the combination with a ribbon vibrator, an operating lever, and means for actuating the same, of a movable fulcrum block for said lever, a slidable frame supporting said block, stops for limiting the sliding movements of said frame, and a spring for restoring said frame to normal position.

7. In a typewriting machine, the combination with a ribbon vibrator, an operating lever, and means for actuating the same, of a movable fulcrum block for said lever, a slidable U-shaped frame to which said block is fixed, said frame being provided with slots, means engaging said slots for slidably securing said frame against the under side of the top plate, limiting stops cooperating with said slots, and a restoring spring connected to said frame.

8. In a typewriting machine, the combination with a ribbon vibrator, an operating lever, and means for actuating the same, of a movable fulcrum frame on which said lever is pivotally supported, limiting stops for said frame, and finger pieces at opposite ends of said frame for moving the same.

9. In a typewriting machine, the combination with a ribbon vibrator, an operating lever, and means for actuating the same, of a movable fulcrum block for said lever, a slidable frame supporting said block, stops for limiting the sliding movements of said

frame, a spring for restoring said frame to normal position, a pivoted stop cooperative with said lever, and means connected with said frame for moving said pivoted stop into and out of operative position.

10. In a typewriting machine, the combination with a ribbon vibrator, an operating lever, and means for actuating the same, of a movable fulcrum block for said lever, a slidable frame supporting said block, stops for limiting the sliding movements of said frame, a spring for restoring said frame to normal position, a pivoted stop cooperative with said lever, and means connected with said frame for moving said pivoted stop into and out of operative position, said last named means comprising a plurality of spring plungers supported on said frame.

11. In a typewriting machine, the combination with a ribbon vibrator, an operating lever, and means for actuating the same, of a movable fulcrum block for said lever, a slidable frame supporting said block, stops for limiting the sliding movements of said frame, a spring for restoring said frame to normal position, a three-armed stop member cooperative with said lever, and means connected with said frame for moving said stop member into and out of operative position, said last named means comprising a plurality of spring plungers supported on said frame, said plungers cooperating with oppositely disposed arms of said stop member, the third arm of said stop member carrying said pivoted stop.

12. In a typewriting machine, the combination with a ribbon vibrator, an operating lever, and means for actuating the same, of a movable fulcrum block for said lever, a slidable frame supporting said block, stops for limiting the sliding movements of said frame, a spring for restoring said frame to normal position, a pivoted stop cooperative with said lever, means connected with said frame for moving said pivoted stop into and out of operative position, and a friction spring for maintaining said stop in adjusted positions.

13. In a typewriting machine, the combination of a ribbon vibrator, actuating devices therefor, a stop for limiting the movement of said vibrator, means for moving certain of said actuating devices relatively to said vibrator, and connections between said means and said stop for throwing said stop into and out of operative position.

14. In a typewriting machine, the combination of a ribbon vibrator, actuating devices therefor, means for moving certain of said actuating devices relatively to the vibrator, and a stop device for certain of said actuating devices, said stop device being connected with said means.

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

lever therefor, a stop for limiting the movement of said operating lever, and means for moving said operating lever relatively to said vibrator, said stop being movable by said means.

16. In a typewriting machine, the combination of a ribbon vibrator, an operating lever, means for disconnecting said lever from said vibrator, and a stop for said lever, said stop being settable by said means.

17. In a typewriting machine, the combination of a ribbon vibrator, a stop for limiting the movements of said vibrator at printing operation, actuating devices for said vibrator, means for changing the relationship between said vibrator and said actuating devices, and means for automatically throwing said stop into and out of operation.

18. In a typewriting machine, the combination of a ribbon vibrator, a stop for limiting the movements of said vibrator at printing operation, actuating devices for said vibrator, means for changing the relationship between said vibrator and said actuating devices, means for automatically throwing said stop into and out of operation, and means for holding said stop in adjusted position.

19. In a typewriting machine, the combination of a ribbon vibrator, a stop for limiting the movements of said vibrator at printing operation, actuating devices for said vibrator, means for changing the relationship between said vibrator and said actuating devices, means for automatically throwing said stop into and out of operation, and a friction spring for holding said stop in either of the positions to which it may be adjusted.

20. In a ribbon vibrating mechanism for typewriting machines, the combination of a member having a single normal position, a stop for said member, a ribbon vibrator connectible with said member at any one of a plurality of connecting points, actuating devices for said member, means for varying the effect of said actuating devices on said member, and automatic means for moving said stop into and out of operation.

21. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means independent of the operation of the machine for affording a change in the normal relationship between said carrier and said lever, and a stop automatically operative by said means.

22. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor, means independent of the operation of the machine for affording a change in the normal relationship between said carrier and said lever, a stop for said lever automatically operative by said means, and devices independent of said means for

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variably actuating said lever at printing operation.

23. In a typewriting machine, the combination of a ribbon operating lever having a
5 single normal position, a ribbon vibrator connectible therewith at any one of a plurality of connecting points, a stop for said lever adapted to be thrown into and out of
10 operation when the connecting point is changed, a key operated universal bar, connections between said universal bar and said lever comprising a link, and means independent of said stop for varying the normal
15 relationship between said link and said lever.

24. In a typewriting machine, the combination of a ribbon operating lever having a single normal position, a ribbon vibrator connectible therewith at any one of a plu-

rality of connecting points, a stop for said 20 lever adapted to be thrown into and out of operation when the connecting point is changed, a key operated universal bar, connections between said universal bar and said lever comprising a link, and means 25 independent of said stop for varying the normal relationship between said link and said lever, said last recited means comprising a hand operated controlling member having a plurality of faces adapted to co- 30 act with said link.

Signed at Syracuse, in the county of Onondaga and State of New York, this 15th day of August, A. D. 1910.

HERBERT H. STEELE.

Witnesses:

ANNA T. LYNCH,
CLARENCE A. DE LAND.