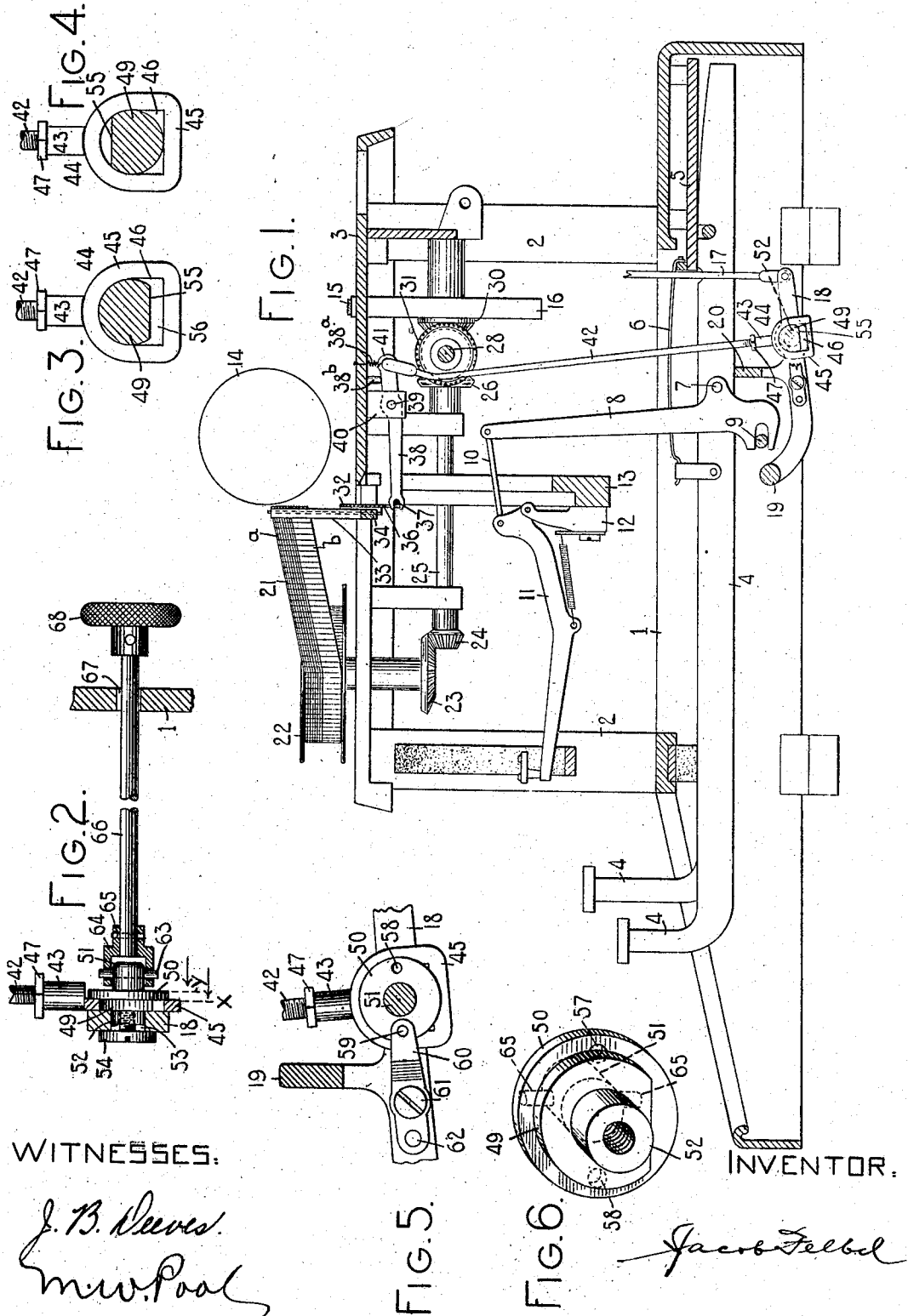


J. FELBEL.  
TYPE WRITING MACHINE.  
APPLICATION FILED SEPT. 17, 1906.

942,137.

Patented Dec. 7, 1909.

4 SHEETS—SHEET 1.

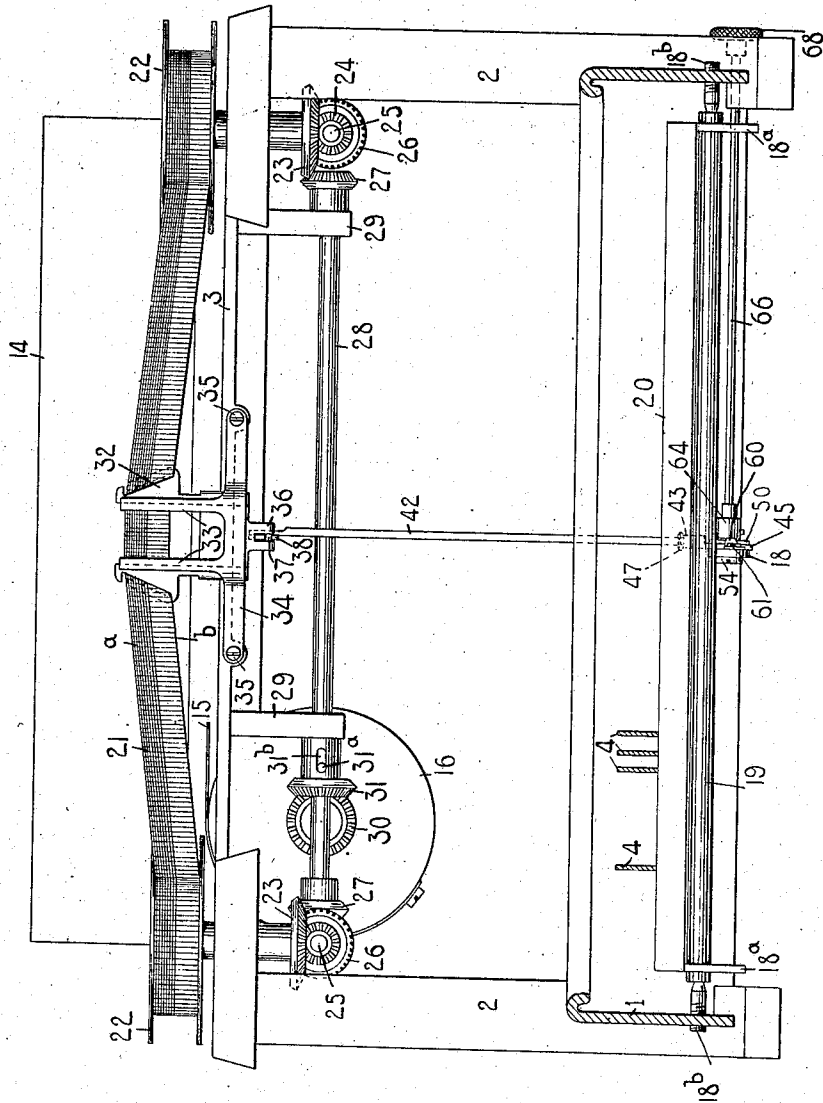


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4 SHEETS—SHEET 2.

FIG. 7.



WITNESSES:

J. B. Reeves.  
m. w. Pool.

INVENTOR.

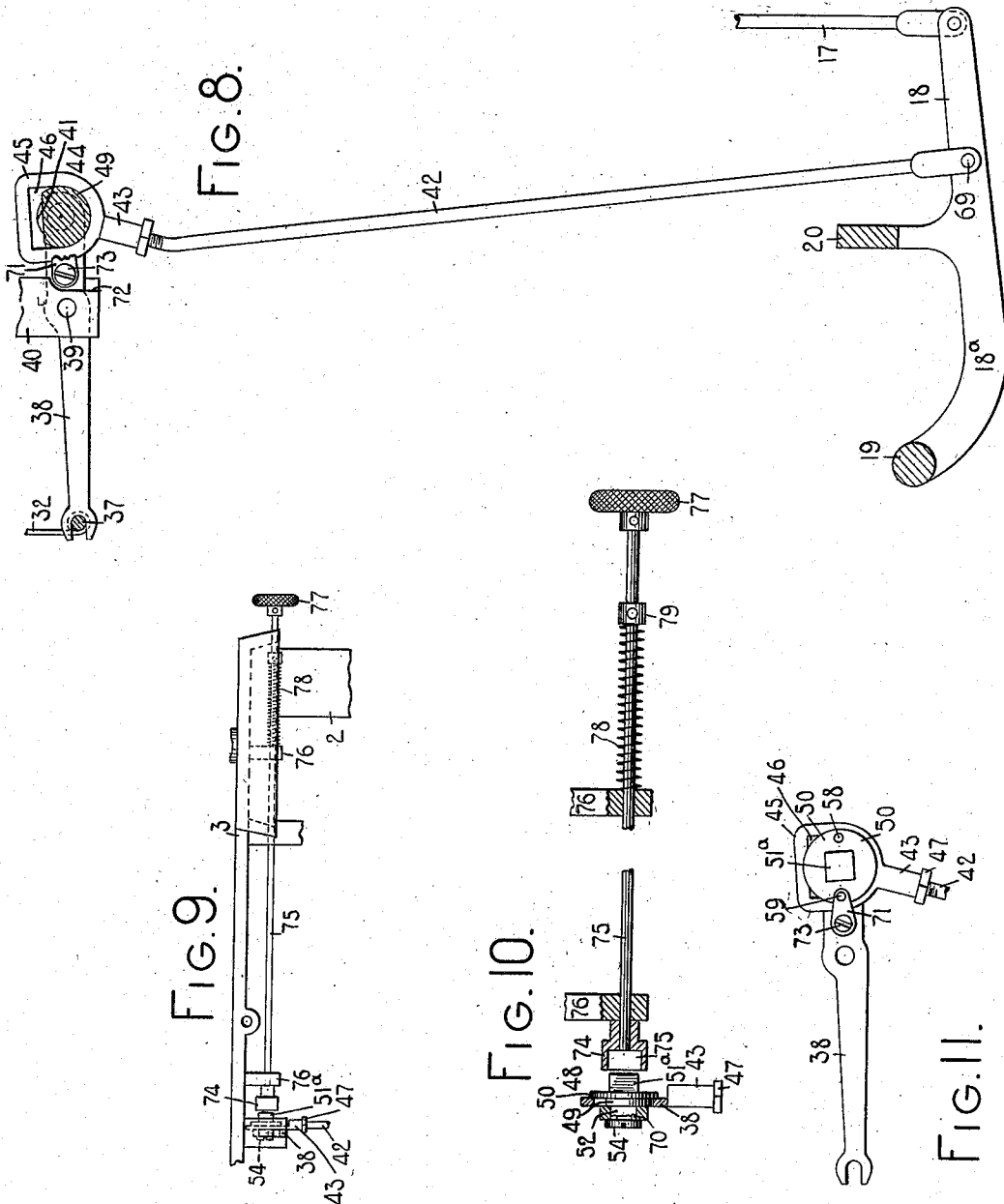
Jacob Felbel

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4 SHEETS—SHEET 3.



WITNESSES:

INVENTOR:

J. B. Reeves.  
Wm. Pool

Jacob Felbel

942,137.

Patented Dec. 7, 1909.

4 SHEETS—SHEET 4.

FIG. 12.

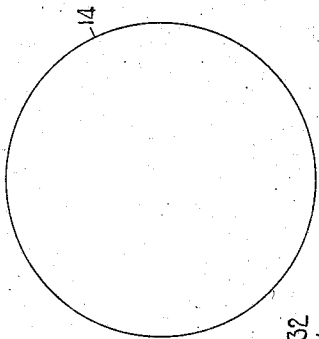
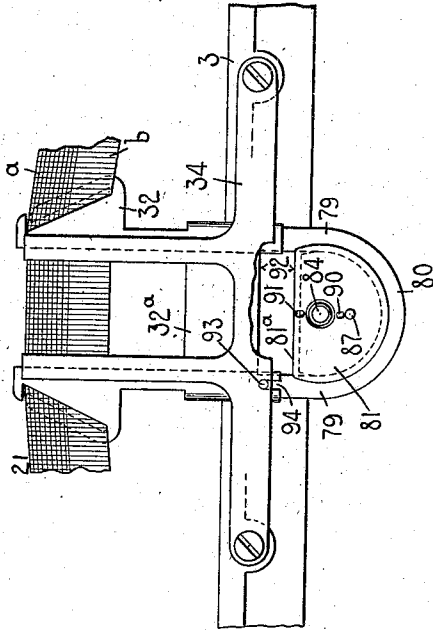


FIG. 13.

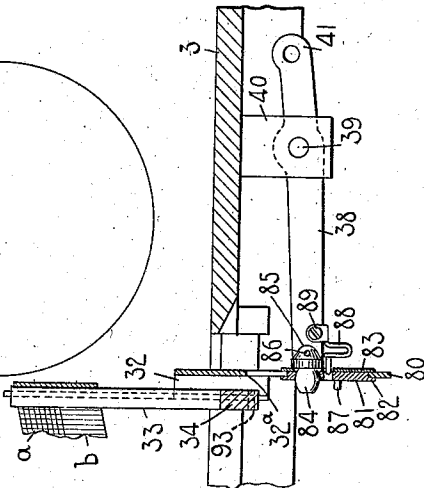


FIG. 16.

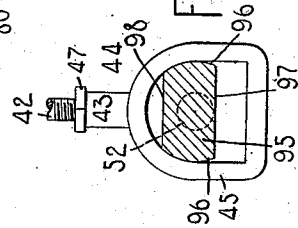


FIG. 15.

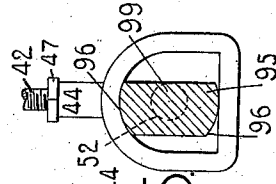
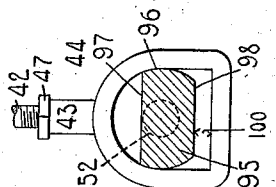


FIG. 14.



WITNESSES.

J. B. Alvers.  
m.w. Pool

INVENTOR.

Jacob Felbel

# UNITED STATES PATENT OFFICE.

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

## TYPE-WRITING MACHINE.

942,137.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed September 17, 1906. Serial No. 334,916.

*To all whom it may concern:*

Be it known that I, JACOB FELBEL, a 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 more especially to the ribbon mechanisms of typewriting machines and has for its main object to provide an improved construction wherein a ribbon normally removed from the printing point and having a plurality of fields of different characteristics may, under the influence of the printing keys, be moved to cover the printing point with any desired field.

Further objects will subsequently appear.

To the above ends the invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter more fully described and particularly pointed out in the claims.

The invention is shown as applied to a Monarch typewriter but the nature of the invention is such that it may be readily adapted to other forms of writing machines.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of a typewriting machine embodying my invention, parts of the machine being omitted. Fig. 2 is an enlarged detail front sectional view illustrating in part improved devices for changing or altering the operative field of the ribbon. Fig. 3 is a detail transverse sectional view taken on a plane represented by the line *x* in Fig. 2 and looking in the direction of the arrow at said line. Fig. 4 is a view corresponding to Fig. 3 but showing the parts in different relations from those in which they appear in said Fig. 3. Fig. 5 is a detail sectional view taken on the plane represented by the line *y* in Fig. 2 and looking in the direction of the arrow at said line. Fig. 6 is a detail elevation of the eccentric or connecting member. Fig. 7 is a vertical transverse sectional view of the machine, parts being omitted. Fig. 8 is an enlarged detail side sectional view of a modified construction of my invention. Fig. 9 is a fragmentary front view of the upper part of the machine showing the modified construction of Fig. 8 applied thereto. Fig. 10

is an enlarged vertical sectional view of some of the parts shown in Fig. 9. Fig. 11 is a detail side view of the upper part of the mechanism shown in Fig. 8. Fig. 12 is an enlarged front elevation of a ribbon vibrator and associated parts and showing a further modification of my invention, certain parts being broken away. Fig. 13 is a vertical sectional view taken centrally of the vibrator shown in Fig. 12. Figs. 14, 15 and 16 are enlarged side elevations partly in section of still another modified construction.

In the drawings, the main frame of the machine is shown as comprising a base 1, corner posts 2 and a top plate 3. Key levers 4 are fulcrumed on a fulcrum plate 5, each key lever being provided with a restoring spring 6 and having pivoted to it at 7 a sub-lever 8. The lower end portion of each sub-lever is slotted to cooperate with a fixed abutment 9 and the upper end of the sub-lever is connected by a link 10 to a type bar 11, said type bar being pivoted in a hanger 12 secured to a segmental hanger support 13 on which the hangers 12 are arranged in segmental series. The type bars cooperate with the front face of a platen 14 which is diagrammatically illustrated in Figs. 1 and 2, said platen being supported in a carriage (not shown) and the carriage being connected by a band or strap 15 with a spring drum 16 which constantly tends to draw the carriage and platen 14 leftward across the top plate. The leftward movements of the platen and carriage are controlled by letter space feeding mechanism which is of the usual construction but is omitted from the drawings, said mechanism comprising devices which are connected by a link 17 with the central rearwardly projecting arm 18 of a universal bar frame, which frame comprises in addition to the arm 18, side arms 18<sup>a</sup>, a rock shaft 19 mounted to turn on screw pivots 18<sup>b</sup> threaded into openings in the base of the machine, and a universal bar proper 20, the latter extending from side to side of the machine beneath the key levers 4 and being adapted to be swung downwardly each time one of said key levers is actuated.

A ribbon 21 is wound upon a pair of ribbon spools 22 one disposed at each side of the machine forwardly of the platen and above the top plate. As herein shown the

ribbon 21 is divided into longitudinal stripes or fields *a* and *b* of different characteristics, that is to say, the field *a* may be of one color, such as black, and the field *b* of another and different color such as red, for example; or the field *a* may be record ribbon and the field *b* copying ribbon. The ribbon may be fed longitudinally from one spool to the other and vice versa by any suitable ribbon feeding mechanism, that shown in the drawings being the usual mechanism of the Monarch machine and comprising for each ribbon spool a beveled gear 23 operatively connected with its associate spool and meshing with a beveled pinion 24 at the forward end of a horizontal shaft 25, said shaft carrying at its rear end a beveled pinion 26. Each pinion 26 is adapted to mesh with a driving pinion 27 fixed to a horizontal driving shaft 28 journaled in lugs 29 depending from the under side of the top plate and extending from side to side of the machine. The driving shaft is connected with and receives motion from the spring drum 16, the connections consisting of beveled gears 30 and 31, the gear 30 being operatively connected with the spring drum and the gear 31 with the driving shaft 28 by a pin 31<sup>a</sup> and slot 31<sup>b</sup> in such a way that while said gear 31 and said shaft turn together yet said shaft may be moved endwise relatively to said gear while the latter is held against movement lengthwise of the shaft by the gear 36 and one of the brackets 27. The endwise movement of the shaft serves to connect one or another of the driving pinions 27 with its associate pinion 26 and to cause one or another of the ribbon spools 22 to be turned to wind the ribbon thereon.

Midway between the ribbon spools the ribbon 21 is threaded through a vibratory ribbon carrier or vibrator 32 which may be of the usual construction and which is guided and supported in the upright arms 33 of a bracket 34 secured by screws 35 to the top plate. The stem 36 of the ribbon carrier carries a cross pin 37 which coöperates with the slotted forward end of an operating lever 38, thereby pivotally connecting said operating lever with said ribbon carrier. The operating lever is fulcrumed at 39 on a fixed pivot in an arm or bracket 40 depending from the under side of the top plate and is connected in a manner now to be particularly described with the arm 18 of the universal bar frame.

In the form of my invention shown in Figs. 1 to 7, inclusive, the rear arm of the operating lever is pivotally connected at 41 with a link 42. The lower end portion of the link 42 is threaded and screwed into a threaded stem or socket 43 of a stirrup-like strap or apertured member 44, said member in addition to the stem comprising a body portion 45 formed with an opening 46, the

stem or socket being above the body portion as shown in Fig. 2. By means of the threaded connection between the lower end of the link 42 and the stem 43 the member 44 may be suitably adjusted when the machine is assembled and after adjustment may be maintained in proper relation with the link 42 by a locking or check nut 47. As best shown in Figs. 3 and 4, the opening or aperture 46 is circular at its upper part and squared at its lower part. Said opening may be formed by cutting a circular opening in the body portion 45 and thereafter cutting out or squaring the lower portion of said opening so that while the upper half of the opening is rounded and the lower half square or angular the lateral diameters of the two halves are equal. The strap 44 is connected with the arm 18 of the universal bar frame, by a connecting member or device, best shown as a whole in Fig. 2. This device comprises a portion 49 which is received in the opening 46 of the stirrup or strap; a larger disk-like portion 50 at one side of the part 49 and serving to retain the strap 44 in place on the part 49; and oppositely projecting hub portions 51 and 52 concentric with the disk 50. The connecting member is rotatively mounted on the arm 18 by the hub 52, which is received in a circular bearing opening 53, formed in said arm and there retained by a headed screw 54, threaded into the end of the hub. The head of the screw abuts one side of the arm 18 and the portion 49 abuts the other side of said arm, the construction being such that endwise motion of the connecting member transversely of the arm 18 is prevented, but said member may be turned or rotated to vary the position of the part 49 within the strap 44. In the present instance, as shown best in Figs. 3 and 4, the portion 49 is circular in cross section to a large extent but is slabbled off or cut away on one side, as indicated at 55, so that the rounded face of said portion 49 is at a greater distance from the center of motion than is the cutaway 55. The radius of the rounded face of the portion 49 is substantially equal to the radius of the circular part of the opening 46 in which it is adapted to turn so that when the part 49 and its opening are in the relation shown in Fig. 3 the upper portion of the part 49 fits closely in the upper portion of the opening while at the lower portion thereof there is a considerable space between the bottom flat wall of the opening and the cutaway flat face 55, this space being indicated in Fig. 3 by the numeral 56, and affording an independent relative movement between the part 49 and the stirrup. The outer or right-hand face of the disk-like part 50 is provided with two holes or depressions 57 and 58 diametrically opposite each other. Coöperative with the

depressions 57 and 58 is a lug or head 59 carried at the free end of a spring arm 60 which is secured to the arm 18 of the universal bar frame by a headed screw 61 and a pin 62, as best shown in Fig. 5.

The lug 59 and spring arm 60 comprise a detent which is prevented from turning as a whole on the arm 18. The construction is such that when the connecting member is rotated the free end of the detent is forced out of one of the holes 57, 58 of the disk and the rounded lug or head 59 engages with the other of said holes to maintain the connecting member in the position to which it has been adjusted. The connecting member may be given rotary movement independently of the operation of the machine by any suitable means. As shown in Fig. 2 a pin 63 is driven crosswise through the hub portion 51, the end portions of said pin cooperating with enlarged openings in a cup-like member 64, said member being secured by a pin 65 to the inner end of a finger rod 66. The finger rod extends laterally outward through an enlarged opening 67 in the right-hand side of the base 1, and outside of the base 1 said finger rod is provided with a finger button 68, by turning which the connecting member may be turned in its bearing in the arm 18. The up and down movements of said arm 18 under the influence of the printing key levers will not be interfered with by the finger rod 66, because the opening 67 is of sufficient size to let the finger rod reciprocate up and down to the necessary extent while the openings in the cup-like member 64 are large enough to prevent any binding action on the ends of the pin 63.

Referring to the operation of the parts thus far described, when the opening 57 in the disk 50 is in cooperation with the spring detent, the portion 49 integral with said disk will normally be in the relation with the stirrup 44 shown in Figs. 1 and 3. It will be apparent from a consideration of these figures that when any key lever is operated the universal bar and the arm 18 will move downward some distance before picking up the link 42, this distance being represented by the space 56. In other words, during the initial stage of the downward movement of the universal bar frame the ribbon vibrator and its operating lever and actuating link will remain quiescent in normal position. As soon as the universal bar frame has moved downwardly far enough to bring the cut-away or flat face 55 into contact with the bottom of the opening 56 the link 42 will begin to move downwardly and the ribbon vibrator will be raised. The parts are so proportioned and arranged that on the completion of the downward movement of the universal bar frame the vibrator will have been lifted far enough to bring the upper or black field *a* of the ribbon opposite the

printing point in position to cooperate with the actuated type bar. It will be apparent that as long as the connecting member and universal bar frame are maintained in the relation shown in Figs. 1, 2, 3 and 5, the ribbon will be raised at each printing operation to the same height and that the type impressions will follow in a path longitudinally of the ribbon and along the upper portion or black field *a* thereof. If desired, there may be employed a returning spring 38<sup>a</sup> and a stop 38<sup>b</sup> for the vibrator lever 38, as shown at Fig. 1. This spring is connected at one end to the lever and at the other end to the top plate. The stop depends from the top plate. When it may be desired to use the lower portion or red field *b* of the ribbon the finger button 68 may be turned a distance of 180° or until the connecting member has been turned to a sufficient extent to disengage the spring from the hole 57 and engage it with the hole 58. This new position of the parts is illustrated in Fig. 4. From a consideration of this figure it will be seen that the cut-away 55 is now at the upper part of the opening 46 and that the rounded face of the part 49 is in contactive engagement with the bottom of said opening 46, the construction being such that the fit between the part 49 and the bottom cross bar of the strap is a comparatively close one and lost motion is done away with. Consequently as soon as the universal bar frame begins to move downwardly under the influence of a printing key lever, the link 42 will begin to move downwardly and the vibrator 32 will begin to move upwardly. The parts are so proportioned and arranged that on the completion of the downward movement of the universal bar frame the ribbon will have been moved upwardly a greater extent than when the parts were arranged as previously described and the lower field *b* will be presented at the printing point. As long as the part 49 is maintained by the spring detent at the position illustrated in Fig. 4 the ribbon will be moved upward to substantially the same extent during the operations of the printing key levers and the types will strike in a substantially straight path longitudinally of the lower field or stripe *b*. It will be perceived that the normal position of the vibrator is the same for both adjustments of the connecting member.

Various changes of construction and arrangement may be made within the scope of my present invention; and in Figs. 8 to 16, inclusive, of the drawings I have illustrated examples of some of such changes. In Figs. 8 to 11, inclusive, the eccentric connection instead of being at the universal bar end of the link 42, as in the first instance, is at the upper end of said link and is carried by the operating lever 38. The lower end portion

of the link 42 is pivotally connected at 69 with the arm 18 of the universal bar frame and the upper end portion of said link is threaded to cooperate with the stem 43 of the strap-like member 44 which, as previously described, comprises the body portion 45 provided with the opening 46. In the present instance the rear arm of the operating lever 38 is provided with a bearing opening 70 which cooperates with the hub 52 of the member 48, as shown in Fig. 10, said member 48 being held from endwise motion and being adapted to turn or rotate in the manner previously described. The member 48 is adapted to be maintained in either of its operative positions on the lever 38 by a spring detent 71 which cooperates with the holes or openings 57 and 58 in the disk 50, the lug 40 being cut away slightly as shown at 72 in Fig. 8 to permit the detent 71 to be secured in place on the lever 38 by a screw 73. In the present instance the right-hand hub portion of the member 48, instead of being cylindrical as in the first instance, is squared as indicated at 51<sup>a</sup>, the squared shape enabling it to properly cooperate with a manually controlled adjusting key. The head 74 of said key is provided with a squared opening or depression 75 which is adapted to fit over the hub 51<sup>a</sup> but is normally disengaged therefrom. The head 74 is suitably secured at the inner end of a rod or shaft 75 mounted in lugs 76 depending from the top plate and extending laterally outward beyond the right-hand edge thereof. The outer end of the rod 75 is provided with a finger button 77 and a spring 78 coiled around said rod and compressed between a collar 79 thereon, and one of the lugs 76 acts to maintain said rod normally in the position shown in Figs. 9 and 10 wherein it will be noted the head 74 is entirely disengaged from the hub 51<sup>a</sup> and a movement of the vibrator and its actuating connections may be effected independently of the manually controlled adjusting key.

With the parts in the position illustrated in Fig. 8 the mechanism will operate to bring the upper field *a* of the ribbon to printing position when the various printing keys are operated. When it is desired to print from the red field *b* of the ribbon the finger button 77 may be pressed inward, overcoming the force of the spring 78 and causing the head 74 to engage with the hub 51<sup>a</sup>. Thereafter the finger button 77 may be turned to rotate the eccentric or connecting member through a distance of 180° or half a turn and so as to disengage the detent from the hole 57 and bring it into engagement with the hole 58. Then the finger button 77 may be released, permitting the spring 78 to disengage the head 74 from the hub 51<sup>a</sup>. With the eccentric member thus readjusted the ribbon will be lifted far enough to pre-

sent the red field *b* to the types at each printing operation, as previously explained. Certain of the features of the construction just described are reserved for another application.

It will be seen that by my present invention I provide means operative to effect a variation in the throw of the ribbon carrier or vibrator without changing the place or point of connection between the means for moving the vibrator and the means for actuating said first named means; that said throw-varying means comprises a pivotal connection or eccentric device adjustable to vary the extent of movement of the operating lever without, however, altering the length of the power arm of said lever; and that the said throw-varying means is adjustable independently of the operation of the machine.

A further modification is illustrated in Figs. 12 and 13 wherein the connecting member or eccentric device is shown as connecting the vibrator 32 and the vibrator operating lever 38. In this construction the usual stem of the vibrator is replaced by a strap or stirrup comprising side arms 79 depending from the sides of the vibrator and joined at their lower ends by a curved part 80. In this instance the cross head 32<sup>a</sup> of the vibrator forms the top of the strap. A connecting member or eccentric device 81 is arranged within the strap and is provided at its front side with a flange 82. A thin plate 83 shaped like the eccentric device proper is suitably secured at the rear of said eccentric device and cooperates with the flange 82 to form a peripheral groove in the eccentric device, which groove fits over the inner edges of the strap, as will be understood from Fig. 13. A bearing opening is formed in the eccentric device 81 and plate 83, which opening receives a bearing stud 84 projecting forwardly from and integral with a bracket 85 secured by a pin 86 to the front end portion of the lever 38. During the vibratory movements of the lever 38 it carries the eccentric device 81 up and down with it. Said device is also rotative on the stud 84, a forwardly projecting finger piece 87 being provided for ready manipulation. A spring detent 88 is pivoted on a screw 89 on the vibrator lever 38 and cooperates at its free end with depressions or openings 90 and 91 in the eccentric device to maintain the latter in its working positions. When the detent 88 and the opening 90 are in cooperation, the eccentric device is normally positioned as shown in Figs. 12 and 13, with the cut-away or straight face 81<sup>a</sup> at the top. With the eccentric device so positioned or set, it is obvious that when the lever 38 is actuated by any printing key, said lever will move upwardly some distance before picking up the vibrator, this distance being represented

by the numeral 92. The parts are proportioned so that this limited movement of the vibrator is sufficient to bring the upper field *a* of the ribbon to the printing point.

5 On the return movement of the lever 38 the rounded lower part of the eccentric engages the curved part 80 of the strap and restores the vibrator to normal position. A stop may be employed to limit the downward  
10 movement of the vibrator. Such a stop is shown in the form of a pin 93 on the bracket 34 and coöperating with a notch 94 in the vibrator.

When it is desired to employ the lower  
15 field *b* of the ribbon, the eccentric device is given half a turn until the opening 91 engages with the detent 88. This brings the curved portion of the eccentric device uppermost, the result being that there is or  
20 may be no lost motion between the lever 38 and the vibrator. The vibrator therefore will participate in the full extent of movement of the operating lever 38 and the ribbon will be lifted far enough to bring its  
25 lower field to printing position.

In the different forms of my invention above described provision is made for moving the vibrator predetermined extents whenever the printing keys are operated.  
30 It may at times be desired, as in mimeograph work, to dispense with movement of the vibrator altogether during operations of the printing keys. My invention lends itself readily to such a construction and in Figs.  
35 14, 15 and 16 I have shown one means of accomplishing this result. These figures illustrate an eccentric device 95 having curved working faces 96 and flat or straight faces 97 and 98 oppositely disposed to each other.  
40 The device 95 may be rotatively mounted on the universal bar in the manner shown in Figs. 1—7 inclusive, said device being adapted to be set either to render one of the faces 96, or the face 97 or the face 98 operative on  
45 the bottom of the strap 44 depending from the link 42. The faces 96 are equidistant from the center of rotation 99 of the eccentric device and when the latter is positioned as shown in Fig. 15, said faces 96 contact with  
50 the top and bottom of the opening in the strap, causing a close fit of the eccentric device therein. As a result there will be no lost motion and the link 42 will participate in the full extent of movement of the universal bar, while the vibrator will be moved  
55 up far enough to bring the red field *b* of the ribbon to the printing point.

When the device 95 is set so that the face 98 is undermost as shown in Fig. 14, then the  
60 universal bar will move downwardly a distance represented by the numeral 100 before picking up the strap and the vibrator will only be moved far enough to render the upper ribbon field *a* operative. The face 97 is  
5 nearer the center of rotation of the eccentric

device than is the face 98. As a result, when the eccentric device is set as shown in Fig. 16 with the face 97 lowermost, the universal bar will complete its downward movement before the face 97 contacts with the bottom  
70 of the opening in the strap. This face 97 may, however, be slightly less distant from the bottom of the strap than shown and contact with the bottom of the strap just before completion of the downward movement of  
75 the eccentric, thus moving the link 42 slightly but not enough to cause the ribbon to move into the path of the types. Consequently the link 42 will not be affected and the vibrator and ribbon will remain in normal  
80 position below the printing point.

The construction shown in Figs. 14 to 16 may be employed at any desired point in the train of connections between the keys and the vibrator.  
85

The modifications shown herein and not claimed specifically in this case will be claimed in separate applications.

One of the essentially novel features of my invention resides in the employment of  
90 what I have designated the eccentric connection between coöperating parts of the train of devices which constitute the ribbon vibrating mechanism. The device in question is in the nature of an eccentric because  
95 it is irregular in its action, depending upon its adjustment, and furthermore because one of its operating sides or members is farther from the center of rotation of the device than another of its operating sides or members. I do not wish to be limited to the use  
100 of this eccentric device at any particular location in the train of devices constituting the ribbon mechanism because, as is evident, it may be employed at any desired locality between the ribbon vibrator and the  
105 universal bar or other device employed primarily to actuate the ribbon vibrating mechanism as an entirety. I have shown this eccentric device in use at three different places in the mechanism, viz., the place of connection between the upper end of the link and the rear end of the ribbon vibrator lever; the place of connection between the  
110 universal bar frame and the lower end of the link; and also at the place of connection between the forward end of the vibrator lever and the lower end of the ribbon vibrator. But it is evident that this eccentric connection might be otherwise located, and various other modifications will readily suggest themselves to those skilled in the art  
115 and especially in efforts to adapt the idea to other styles of ribbon mechanisms. I therefore desire to claim this feature of my invention as broadly as possible.  
120

The universal bar frame is a lever of the third order, while the ribbon vibrator lever 38 is a lever of the first order. It is immaterial, though, which order of lever is used  
130

for either of these devices. It will be observed, however, that in both Figs. 1 and 8 the device is used as a connection between a lever and a link and that in all cases the eccentric connection is used between an actuated device and an actuating device. For example, in Figs. 1 to 6 the link 42 may be considered the actuated device and the lever 18 the actuating device; in Fig. 8 the vibrator lever 38 may be considered the actuated device and the link 42 the actuating device; and in Figs. 12 and 13 the ribbon vibrator 32 may be considered as the actuated device and its lever 38 as the actuating device. It will also be observed that the eccentric connection between any two devices remains always connected with said devices at the same place. Unlike prior devices it is not a device which is shiftable to a new position relatively to the length of an arm of a lever so as to vary the point or place of connection of an actuating device to said lever arm and in that way lengthen or shorten the lever and vary the point of application of the power and the leverage on the ribbon vibrator. It will be observed furthermore that the faces or members of the connecting device cooperate each with the same portion of the part with which said connecting device is associated.

Various other changes besides those described may be made without departing from my invention. For example, the part 49 of the connecting member may in some instances have forms other than that shown in the present instance.

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

1. In a typewriting machine, the combination with a ribbon normally removed from the printing point, of means for causing the ribbon to cover the printing point at printing operations, said means comprising an actuating device, a device actuated by said actuating device, and a connection between said devices, said connection being capable of imparting different extents of movement to said actuated device and to the ribbon and said connection being always connected with said devices at the same places or points on said devices.

2. In a typewriting machine, the combination with a ribbon normally removed from the printing point, of means for causing said ribbon to cover the printing point at printing operations, said means comprising an actuating device, a device actuated by said actuating device, and a connection between said devices, said connection being adjustable at will to vary the movement of the ribbon and said connection being always connected with said devices at the same places or points on said devices.

3. In a typewriting machine, the combination of a ribbon vibrator having a single

normal position, a key actuated universal bar, and actuating connections between said parts, one member of which is a rotatively-mounted device adjustable to vary the throw of the vibrator without altering the normal position thereof.

4. In a typewriting machine, the combination of a ribbon normally removed from the printing point, a key actuated universal bar, and devices between the universal bar and ribbon for vibrating the latter at printing operations, said devices comprising a rotatively-mounted connection adjustable to vary the vibratory movement of the ribbon without altering the normal position of the latter.

5. In a typewriting machine, the combination of a ribbon vibrator, a key actuated universal bar, connections between said vibrator and said universal bar, said connections including an eccentric for varying the throw of the vibrator, said eccentric forming an element of the connections.

6. In a typewriting machine, the combination of a ribbon vibrator, a key actuated universal bar, connections between said parts including a link and a lever, the lengths of the lever arms always remaining the same and the lever element having a fixed unchanging fulcrum; and means forming part of the connections for varying the throw of the vibrator.

7. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor having a fixed unchanging fulcrum, a pivoted universal bar, a link pivotally connected with said universal bar and said operating lever at constant distances from their fulcra, and a device forming part of the connections and operating to cause said link to move said operating lever different extents to vary the throw of said vibrator.

8. In a typewriting machine, the combination of a platen, a ribbon vibrator, and means for operating the vibrator to cause the ribbon to cover the printing point, said means comprising an actuating device, a device actuated by said actuating device, and means carried by one of said devices for determining the relation between said devices and varying at will the position relative to the platen to which the ribbon is moved at printing operations.

9. In a typewriting machine, the combination of a platen, a ribbon vibrator, and means for operating the vibrator to cause the ribbon to cover the printing point, said means comprising an actuating device, a device actuated by said actuating device, and means carried by one of said devices and adjustable independently of said device for determining at will the relation between said devices and the position to which the ribbon is moved at each operation.

10. In a typewriting machine, the combination of a platen, a ribbon vibrator, means for operating the vibrator to cause the ribbon to cover the printing point, said means  
5 comprising an actuating device, a device actuated by said actuating device, and an adjustable rotatory connecting means between said devices for determining their relationship and the throw of the ribbon vibrator.  
10

11. In a visible writing machine, the combination of a platen, a ribbon vibrator, and means for operating the vibrator to cause the ribbon to cover the printing point, said  
15 means comprising a pivoted actuated device, a device for actuating said actuated device, said actuating device always acting on said pivoted actuated device at the same distance from the fulcrum of the latter, and means  
20 carried by one of said devices and adjustable independently of the operation of the machine for determining the relation between said devices and the position to which the ribbon is moved at each operation.

25 12. In a typewriting machine, the combination of a ribbon having fields of different characteristics, a ribbon vibrator, a key-actuated universal bar, connections between said vibrator and said universal bar comprising link and lever elements, the points  
30 at which said vibrator, universal bar, link and lever elements act on one another always remaining unchanged in respect to leverage, and said connections including  
35 means capable of providing lost motion between said universal bar and said vibrator to render one of said ribbon fields operative and also capable of providing a close connection between said universal bar and said  
40 vibrator to render another of said ribbon fields operative.

13. In a typewriting machine, the combination of a ribbon, a universal bar, a device carried by said universal bar and adapted to  
45 be set in different positions relatively thereto, and connections between said device and the ribbon.

14. In a typewriting machine, the combination of a ribbon vibrator, actuating means  
50 therefor comprising a universal bar frame and an eccentric rotatable at will on said universal bar frame to control the throw of the vibrator.

15. In a typewriting machine, the combination of a ribbon vibrator, actuating means  
55 therefor comprising a link and a universal bar frame, and a device adjustable at will on said universal bar frame to vary the action of the universal bar frame on the link and thus control the throw of the vibrator.  
60

16. In a typewriting machine, the combination of a ribbon vibrator, actuating means  
65 therefor comprising a link and a universal bar frame, and a device adjustable at will on said universal bar frame to vary the action

of the universal bar frame on the link and thus control the throw of the vibrator, and means manually operative from outside the machine to adjust said device.

17. In a typewriting machine, the combination of a ribbon vibrator, actuating means  
70 therefor comprising a universal bar frame and an eccentric on the universal bar frame, and controlling the throw of the vibrator, and a finger rod for adjusting the eccentric.  
75

18. In a typewriting machine, the combination of a ribbon vibrator, a universal bar, means for actuating said vibrator including  
80 two members and a connecting member between said two members, said connecting member bearing in an opening in one of said two members and being rotatively adjustable axially in said opening independently  
85 of said two members to afford lost motion therebetween to change the throw of the ribbon, and means operative independently of the operation of the machine to adjust said connecting member.

19. In a ribbon mechanism, a lever and a link joined together by an adjustable eccentric connection, said eccentric connection being adjustable at will independently of said  
90 lever and said link and also of the operation of the ribbon mechanism to afford either a close connection between said lever and link  
95 or a lost motion connection between said members.

20. In a ribbon mechanism, the combination with two cooperating parts in a train of  
100 devices arranged to vibrate the ribbon from a fixed normal position to the printing point and return, of an eccentric connection between said two parts and adjustable independently of said two parts for varying at  
105 will the throw of said ribbon toward the printing point.

21. In a ribbon vibrating mechanism, the combination of one reciprocating part carrying an eccentric and a cooperating reciprocating part carrying a strap, the eccentric  
110 being adjustable by hand to set the mechanism in a different relationship and for the purpose of varying the throw of the ribbon and causing it to work constantly in a given  
115 longitudinal field of the ribbon until a new adjustment has been made.

22. In a ribbon mechanism, the combination with two cooperating parts in a train of devices arranged to vibrate the ribbon  
120 from a fixed normal position to the printing point and return, of a connection between said two parts having a plurality of operating members each adapted to co-act with the same portion of the part with which it is  
125 associated and adjustable at will either to vary the throw of said ribbon toward the printing point or to render the ribbon vibratory devices inoperative.

23. In a typewriting machine, the combination of a ribbon normally removed from  
130

the printing point, a key actuated universal bar, and devices between the universal bar and ribbon for vibrating the latter at printing operations, said devices comprising a rotatively-mounted connection adjustable to vary the vibratory movement of the ribbon without altering the normal position of the latter, said connection being further adjustable to a position where it is inoperative to actuate the ribbon.

24. In a typewriting machine, the combination of a ribbon vibrator having a single normal position, a key actuated universal bar, and actuating connections between said parts, one member of which is a rotatively-mounted device adjustable to vary the throw of the vibrator without altering the normal position thereof; said device being further adjustable to a position where it is inoperative to actuate the ribbon vibrator.

25. In a typewriting machine, the combination of a ribbon vibrator, a key-actuated universal bar, connections between said parts including a link and a lever, the lever element having a fixed unchanging fulcrum and unvarying arms, and means forming part of the connections for varying the throw of the vibrator, said means being also adjustable to a position where it is inoperative to actuate the ribbon vibrator.

26. In a typewriting machine, the combination of a ribbon vibrator, an operating lever therefor having a fixed unchanging fulcrum, a pivoted universal bar, a link pivotally connected with said universal bar and said operating lever at constant dis-

tances from their fulcra, and a device forming part of the connections and operating to cause said link to move said operating lever different extents to vary the throw of said vibrator, said device being also adjustable to a position where it is inoperative to actuate the ribbon vibrator.

27. In a ribbon mechanism, the combination with two coöperating parts in a train of devices arranged to vibrate the ribbon from a fixed normal position to the printing point and return, of an eccentric connection between said two parts and adjustable at will independently of said two parts either to vary the throw of said ribbon toward the printing point or to render the ribbon vibratory devices inoperative.

28. In a ribbon vibrating mechanism, the combination of one reciprocating part carrying an eccentric and a coöperating reciprocating part carrying a strap, the eccentric being adjustable by hand to set the mechanism in a different relationship and for the purpose either of varying the throw of the ribbon and causing it to work constantly in a given longitudinal field until a new adjustment has been made or for rendering the ribbon vibrating mechanism inoperative.

Signed at the borough of Manhattan, city of New York, in the county of New York, and State of New York, this 15th day of September A. D. 1906.

JACOB FELBEL.

Witnesses:

J. B. DEEVES,  
E. M. WELLS.