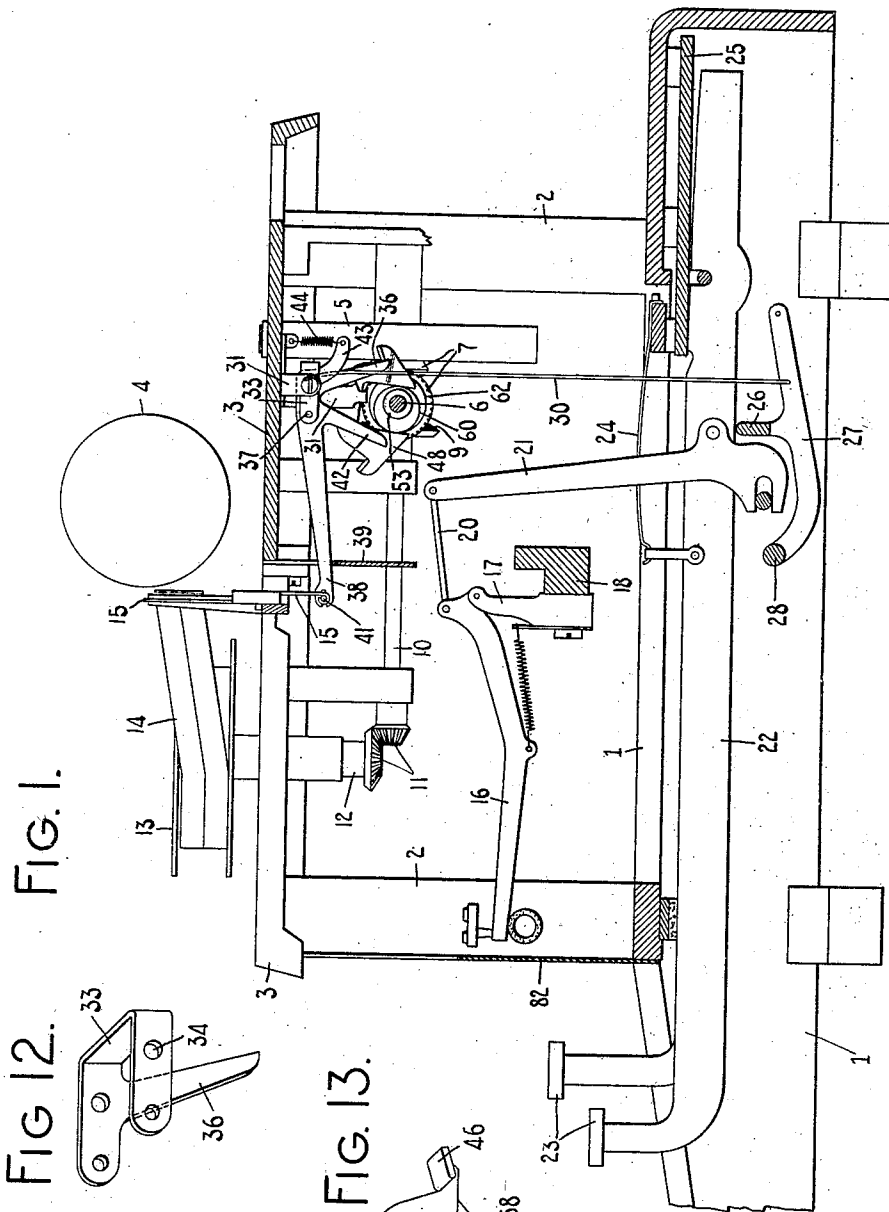


R. H. STROTHER.
TYPE WRITING MACHINE.
APPLICATION FILED JULY 16, 1912.

1,050,248.

Patented Jan. 14, 1913.

3 SHEETS—SHEET 1.



WITNESSES:

M. F. Hannover

Wm. Smith

INVENTOR:

Robert H. Strother

My Jacob Feld

HIS ATTORNEY

R. H. STROTHER.
TYPE WRITING MACHINE.
APPLICATION FILED JULY 16, 1912.

1,050,248.

Patented Jan. 14, 1913.

3 SHEETS—SHEET 2.

FIG. 2.

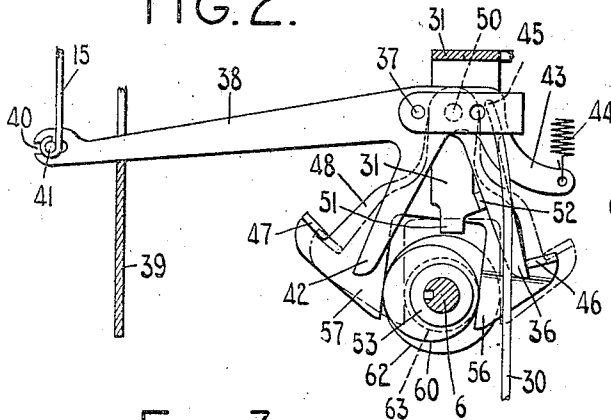


FIG. 3.

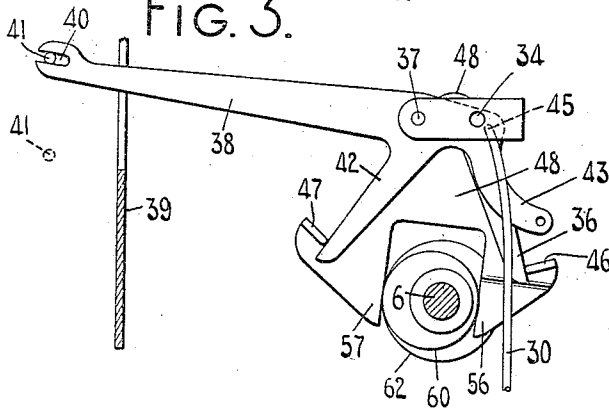


FIG. 4.

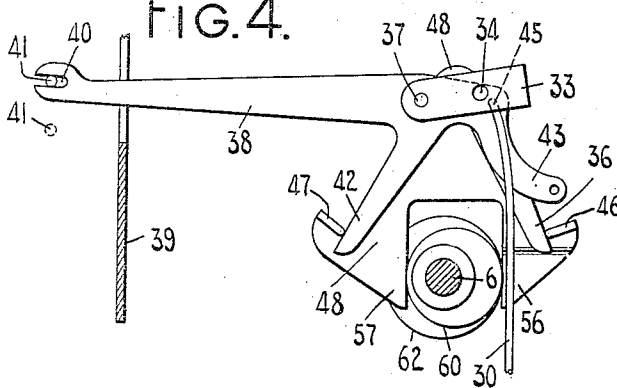


FIG. 5.

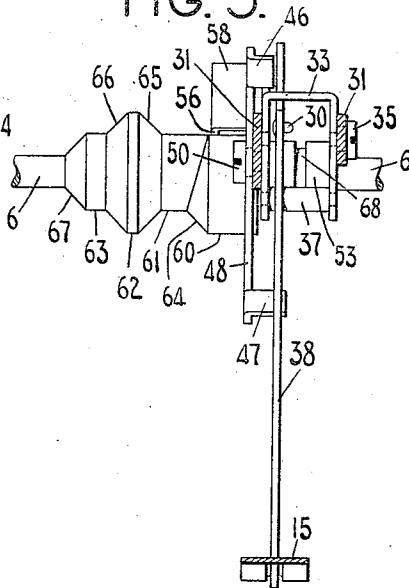
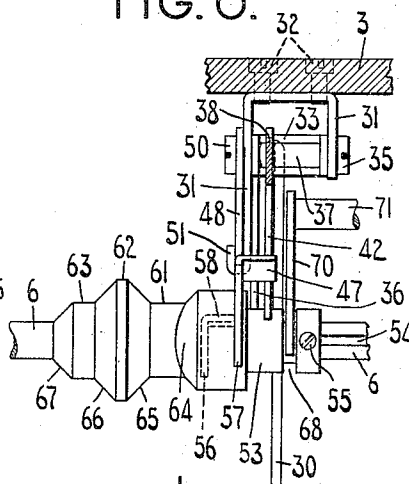


FIG. 6.



WITNESSES:

M. F. Hanniweber

Wm. R. Smith

INVENTOR:

Robert H. Strother

By Jacob Selbe

HIS ATTORNEY

1,050,248.

Patented Jan. 14, 1913.

3 SHEETS—SHEET 3.

FIG. 11.

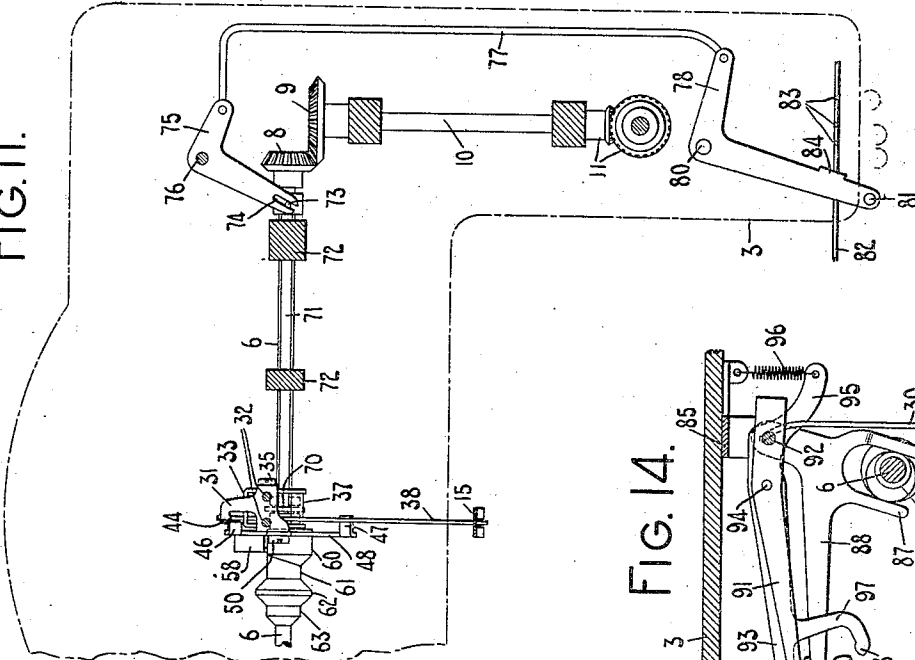


FIG. 14.

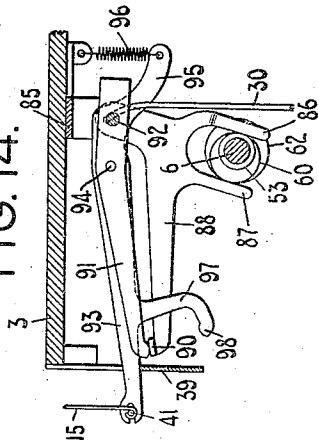


FIG. 7.

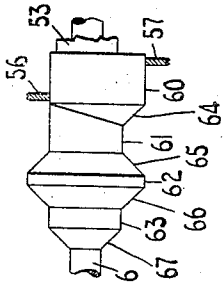


FIG. 8.

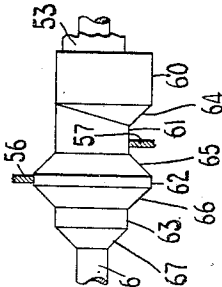


FIG. 9.

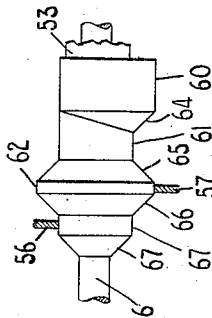
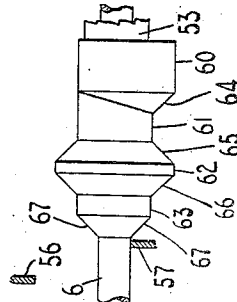


FIG. 10.



WITNESSES:

M. F. Hammer

Wm. R. Smith

INVENTOR:

Robert H. Strother

By *Jacob F. Felt*

HIS ATTORNEY

UNITED STATES PATENT OFFICE.

ROBERT H. STROTHER, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO UNION TYPE-WRITER COMPANY OF NEW JERSEY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

1,050,248.

Specification of Letters Patent.

Patented Jan. 14, 1912.

Application filed July 16, 1912. Serial No. 709,622.

To all whom it may concern:

Be it known that I, ROBERT H. STROTHER, citizen of the United States, and resident of Montclair, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to typewriting machines and more particularly to the ribbon vibrator mechanism of visible typewriters.

The principal objects of the invention are to provide improved means for operating the ribbon vibrator and especially to vary the throw of the vibrator to use different stripes of the ribbon as, for example, in those instances where the ribbon is impregnated with two different kinds of ink.

My invention also includes means for throwing the ribbon vibrator out of operation as for mimeograph purposes.

In one sense the invention may be said to be an extension of the same broad idea as that embodied in my prior application filed July 6th, 1912, Serial No. 707,984, the present case showing an adaptation of said broad idea to another machine than that shown in the prior application.

Among other things the present invention includes means for imparting an automatic cross feed to the ribbon.

To the above and other ends my invention consists in certain features of construction and combinations and arrangements of parts all of which will be fully set forth herein and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front to rear vertical sectional view of as much of a front-strike typewriter as is necessary to illustrate the embodiment of my invention therein. Fig. 2 is a detail view of the ribbon vibrator operating mechanism as seen in elevation from the right-hand side. In this view the mechanism is set for automatic cross feed; and the parts are in the positions they occupy when the machine is at rest, that is to say, when no key is depressed. Figs. 3 and 4 are views like portions of Fig. 2 but showing the parts when a key is fully depressed. In Fig. 3 the mechanism is in position to write from the lower part of the ribbon and in Fig. 4 from the upper part of the ribbon. Fig. 5

is a plan view of Fig. 2 with parts in section. Fig. 6 is a front elevation of the same mechanism with parts in section. Figs. 7, 8, 9 and 10 are fragmentary top views with parts in section and illustrating the different settings of the mechanism. In Fig. 7 the adjustable sleeve is set for automatic cross feed. In Fig. 8 it is set to write from the lower stripe of the ribbon. In Fig. 9 it is set to write from the upper stripe of the ribbon; and in Fig. 10 it is set for mimeographing. Fig. 11 is a top plan view partly in section. Figs. 12 and 13 are isometric views of certain levers. Fig. 14 is a side view partly in section and illustrating a modification. Figs. 1, 11 and 14 are on a reduced scale and the remaining figures are on a larger scale than said Figs. 1, 11 and 14.

I have shown my invention embodied in a Monarch typewriter, which typewriter, however, is more or less conventionally illustrated. The main frame of the Monarch machine comprises a base part 1, corner posts 2 and a top plate 3. The machine has a paper carriage on which is mounted a platen 4. Said carriage is fed across the machine by a spring drum 5 and is controlled by escapement mechanism (not shown). Said spring drum, through a pawl and ratchet connection, operates a transverse driving shaft 6 for the ribbon mechanism, the construction being such that said shaft 6 turns only during the movement of the carriage toward the left. The bevel gearing between the drum and the shaft is indicated at 7. Said shaft 6 also has at each end a bevel pinion 8 that meshes with a bevel gear 9 on a forwardly extending shaft 10, which shaft, through gearing 11, drives a vertical shaft 12 of a ribbon spool 13 on which is coiled the ink ribbon 14. Said ink ribbon is led near the printing point through a vibratory guide 15. The front-strike type bars 16 are pivoted to hangers 17 which are mounted on a type bar segment 18. Said type bars are operated by links 20 and bell cranks 21, the latter pivoted to printing key levers 22 having printing keys 23 on their forward ends. The key levers 22 are provided with returning springs 24 and are fulcrumed at their rear ends against a fulcrum plate 25. Beneath said key levers lies a universal bar 26 forming part of a frame, which frame also comprises arms 27 and a rock shaft 28, the

latter pivoted at its ends in the side plates of the base 1. The arm 27 shown in Fig. 1 is the middle one of three arms in the universal bar frame and it is connected by means of a link 30 with the ribbon vibrator mechanism. All of the parts so far described are, or may be, of the ordinary Monarch construction; or, as far as my invention is concerned, they can be of any suitable construction.

The operating mechanism that connects the link 30 with the vibrator 15, is mounted in a frame 31 which is secured by two screws 32 (Fig. 6) to the under side of the top plate 3. This frame, as best shown in Fig. 6, comprises two arms which depend vertically from the top plate and between which there is pivoted a lever 33 shown in Fig. 12 and consisting of a yoke-shaped frame with two horizontal arms each having a hole 34 into which a pivot pin projects from one of the arms of the frame 31. On one side said pivot pin consists of the reduced inner end of a screw 35 (Figs. 5 and 6). One of the arms of the lever 33 extends downward and toward the rear of the machine, forming a lever arm 36 (Fig. 3). The forward ends of the arms of the lever 33 are connected by the pivot pin 37 of the vibrator operating lever 38, the forwardly extending arm of which passes through a vertical slot in a front plate 39 and is formed at its end with a slot 40 through which passes a pin 41 at the lower end of the stem of the vibrator 15. The lever 38 also has an arm 42 extending downward and toward the front of the machine; and another arm 43 extending downward and toward the rear and to said arm 43 there is connected a restoring spring 44, the upper end of which is connected to an arm of the frame 31 as shown in Fig. 11. The downward motion of the front end of the lever 38 under the impulse of said spring and of gravity, may be limited in any suitable way, as, for example, by the bottom of the slot in the plate 39. The link 30 is pivoted to the lever 38 at 45 which is a point in the rear of the pivot 37 of said lever but not very far removed from the pivotal axis of the lever 33. It will be perceived that the lever 38 may be termed a "floating lever" as it is pivoted to the lever 33 which in turn is pivoted to the stationary framework.

The levers 33 and 38 are, through their respective arms 36 and 42, controlled, the first by a stop 46 and the other by a stop 47, said stops consisting of ears bent off from a plate 48 which is pivoted to the outer face of one of the arms of the frame 31, on a pivot screw 50, so that said plate 48 can rock in a front and back direction. In order to stiffen said plate the lower end of the frame 31 is bent around underneath said plate and up beside it, forming a hook or guard 51 (Fig.

6). The lever arm 36 is normally held against a stop 52 (Fig. 2) bent off from this same depending arm of the frame 31. When the keys are in normal position, the arms 36 and 42 occupy the relative positions shown in Fig. 2; but when a key is depressed, said two arms are caused to move apart or away from each other until they are arrested by the stops 46 and 47, as shown in Figs. 3 and 4. It will be perceived that the relative position of the two levers is the same in Figs. 3 and 4 but their actual positions are different because the plate 48 is not in the same position in the two figures. It will be perceived that the actual position to which the lever 38 and the ribbon vibrator are moved, will depend upon the position of this plate 48. The variations in the throw of the ribbon vibrator, are effected by means designed to control said plate 48. In the present instance this means consists of a sleeve 53 mounted on the shaft 6 and splined to said shaft by means of a groove 54 (Fig. 6) and the reduced inner end of a screw 55 threaded through the sleeve 53 and extending into said groove. The sleeve 53 can be adjusted lengthwise of the shaft to any one of the four different positions shown in Figs. 7 to 10, inclusive. The plate 48 is cut out, as shown, for example, in Fig. 4 and straddles the shaft 6 and sleeve 53. The two arms or branches of said plate are so spaced apart that they are both either in actual contact with the sleeve, or very nearly so, at all times. These arms consist of a rear arm 56 and a forward arm 57, the former bent off from an off-set part 58 as shown in Fig. 6 so that the arm 56 is off-set toward the left from the arm 57, as indicated somewhat diagrammatically in Figs. 7 to 10, inclusive. The sleeve 53 comprises an eccentric section 60 and several concentric sections consisting of a cylindrical section 61 of comparatively small diameter, a cylindrical section 62 of large diameter, a cylindrical section 63 of small diameter, and connecting cones 64, 65, 66 and 67.

When the sleeve 53 occupies its extreme left-hand position shown in Fig. 7, both arms 56 and 57 cooperate with the eccentric section 60 of said sleeve with the result that, as the shaft 6 is turned in the stepping motion of the carriage, the plate 48 is rocked back and forth between the two extreme positions shown respectively by full lines and dotted lines in Fig. 2. The effect of this gradual change in the position of the plate 48 will be to cause the ribbon to be thrown at one time to its greatest height as shown in Fig. 3, at another time to its least height as shown in Fig. 4 and at other times to intermediate heights. Meanwhile the ribbon is being fed longitudinally and the effect therefore will be to cause the types to strike against the ribbon along a wavy line, thus

automatically utilizing the entire width of the ribbon.

When the sleeve 53 is adjusted to the right to the position shown in Fig. 8, the arm 56 is caused to ride up on the highest cylindrical part 62 and the arm 57 to ride on to the lower cylindrical part 61. In this way the plate 48 is swung to the position shown in Fig. 4 and it will remain in that position as long as the sleeve 53 has the adjustment shown in Fig. 8. This is also the position of the plate 48 shown by broken lines in Fig. 2 where it will be seen that normally the stop 46 stands a short distance back of the arm 36 and the stop 47 a short distance in front of the arm 42. When the plate stands in this position the effect of the first part of the key depression is to swing the lever 33 about its pivot 35 until the arm 36 is arrested by the stop 46. When that occurs at somewhere near the middle of the key stroke, the lever 33 is arrested and the pivot 37 then becomes a fixed pivot and the remainder of the key stroke is occupied in moving the lever 38, 42 to the position shown in Fig. 4 where said lever is arrested by the stop 47. In the case of a ribbon having an upper stripe of blue and a lower stripe of red, the setting just described would be that for writing in blue. When the sleeve 53 is moved still farther to the right to the position shown in Fig. 9, the arm 57 coöperates with the high section 62 and the arm 56 is moved on to the lower part 63. The result of this will be to swing the plate 48 to the same position as that indicated in Fig. 3 and by full lines in Fig. 2. Referring to Fig. 2 it will be perceived that in this position of the parts the stop 46 is normally in contact or substantially so with the arm 36 so that said arm is held against motion and the lever 32 therefore turns substantially about a fixed pivot and it is thrown to the full extent of which it is capable, said lever being then positively arrested by the stop 47. This, therefore, is the position to which the sleeve 53 is adjusted when it is desired to write continuously from the lower stripe of the ribbon, which, in the example above supposed, would be the red stripe. As the sections 63, 62 and 61 are concentric, the rotation of the shaft 6 does not effect any change in the operation of the vibrator except when the sleeve is set as shown in Fig. 7.

In case it is desired to throw the ribbon vibrator entirely out of operation, as for mimeograph work, the sleeve 53 may be adjusted still farther to the left to the position shown in Fig. 10 where the said sleeve moves entirely out of coöperation with the arms 57 and 56. At the first key stroke the tendency will be to swing the arm 36 toward the rear, this arm pressing against the stop 46. As there is nothing to resist this pres-

sure the plate 48 will swing with the arm 36 to the position shown in Fig. 10 and the ribbon vibrator will remain inactive.

Any suitable means can be provided for adjusting the sleeve 53. As here shown (Fig. 6) said sleeve is formed with an annular groove 68 into which an arm 70 projects from a slide rod 71 which passes through holes in the same brackets 72 that support the shaft 6. At its right-hand end the rod 71 has a pin 73 projecting into a slot 74 in the end of the bell crank 75 pivoted at 76 to the under side of the top plate, all as shown in Fig. 11. The bell crank 75 is connected by a link 77 with a second bell crank 78 at the front of the machine, said bell crank 78 being pivoted at 80 and having at its forward end a handle 81 that projects through the front plate 82 of the typewriter. The lever projects through a slot in said front plate and said slot is formed with a series of notches 83 in which a tongue 84 of said lever is adapted to engage to hold the lever in any one of the four positions indicated and which positions correspond to the four positions of the sleeve 53 shown in Figs. 7 to 10 inclusive.

Comparing the present invention with that disclosed in my prior application above referred to, it will be seen that there are the following differences among others, namely, that the two connected lever arms move outward against the stops instead of inward, that is to say, that they move away instead of toward each other; that there are two stops in use at a time instead of one; that instead of varying the stops by substituting one stop for another as in my prior case, the same stops are employed at all times and the variation is effected by moving or adjusting said stops to different set positions, and such adjustment is substantially in the direction of motion of the lever arms 36 and 42. This last feature of the present invention makes the present form of stops better adapted than the former ones for giving an automatic cross feed to the ribbon. The adjustment of the stops by means of the sleeve 53, is also new in the present case.

Some of the features above enumerated are also present in a modified form of the invention shown in Fig. 14. In this figure the parts are supported by a frame 85 which is secured to the underside of the top plate in the same way as the frame 31 of the form of the invention shown in Figs. 1 to 13, inclusive. The sleeve 53 is mounted on the shaft 6 in the same way and is adjusted in the same way and said sleeve performs the same functions as in the other figures of the drawings. Said sleeve coöperates with two arms 86 and 87 which resemble the arms 56, 57 in that one of them is behind and the other in front of the sleeve 53 and that one is off-set to the

left of the other. These arms project from a stop lever 88 which is pivoted to the bracket 85 in a way similar to the plate 48. Said lever 88, however, projects toward the front of the machine where it has a stop lug 90 projecting therefrom. A lever 91 has its forward end lying above the stop 90 and near its rear end it is pivoted at 92 in the bracket 85. A lever 93, having at its forward end a slot that embraces the pin 41 of the ribbon vibrator, is pivoted at 94 to the lever 91, and said lever 93 has a rearwardly and downwardly projecting arm 95 to which is connected a returning spring 96, the upper end of which is connected to the frame 85. The link 30 is pivoted to the lever 93 back of the pivot 94. Said lever 93 has a downwardly projecting branch 97 having an arm 98 projecting forward therefrom beneath the stop 90. The construction is such that the parts are normally held in the position shown in Fig. 14 by means of the spring 96, the restoring spring of the universal bar, if there be such, and by the means, whatever that is, that limits the downward motion of the forward end of the lever 93. This last mentioned means may consist of suitable means for arresting the downward motion of the ribbon vibrator or it may consist of means, as the plate 39, cooperating with said lever 93.

With the parts standing in the positions shown in Fig. 14, if a key be depressed the lever 91 will be prevented by the stop 90 from descending. The pivot 94 is therefore a fixed pivot and the forward end of the lever 93 will be moved upward to its fullest extent until arrested by the arm 98 striking the stop 90. If the sleeve 53 is so adjusted as that the eccentric section 60 thereof cooperates with the arms 86, 87, then the turning of the shaft 6 will gradually turn said eccentric and move the stop 90 downward. The height to which the vibrator will be thrown will depend upon the height of the stop 90. If said stop is in a lower position than shown in Fig. 14, part of the down stroke of the key will be lost by being taken up by downward motion of the lever 91. When said lever is arrested by the stop 90 the remainder of the key stroke will be used in raising the lever 93 and the ribbon vibrator until arrested by said stop 90.

It will be perceived that the broad principle of the present invention is in many respects identical with that of my prior application above referred to. The present invention, like the former one, includes two parts connected together in such a way that each key stroke imparts a definite extent of relative motion to said two parts, the sum of the motions of the two parts being substantially constant under all con-

ditions. The motion is distributed between the two parts by variable stopping means consisting, in Figs. 1 to 13 inclusive, of the stops 46 and 47, and, in Fig. 14, of the stop 90.

Various changes can be made in the details of construction and arrangement, 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 printing keys, two relatively movable parts, means for moving said two parts away from each other a definite distance at the key strokes, two stops arranged to arrest such motion of said parts, means for adjusting said stops to different set positions, and a ribbon vibrator controlled by said parts.

2. In a typewriting machine, the combination of printing keys, two levers connected together, means for moving an arm of each of said levers so that said arms move apart at a key stroke, two stops for arresting such motion of said arms, means for adjusting said stops to different set positions, and a ribbon vibrator operated by said levers.

3. In a typewriting machine, the combination of two parts, printing keys, means for giving said two parts a definite extent of relative motion at each key stroke, stopping means for said parts adjustable in the direction of movement of said parts, and a ribbon vibrator operated by said parts.

4. In a typewriting machine, the combination of two parts, printing keys, means operated by said keys for imparting to said two parts a definite amount of relative motion at each key stroke, stopping means for arresting said parts at the key strokes, a ribbon vibrator connected with said parts, and means for automatically varying said stopping means in order to impart a cross feed to the ribbon.

5. In a typewriting machine, the combination of printing keys, two relatively movable parts, means operated by said keys for imparting to said parts definite extents of relative motion at each key stroke, stopping means for said parts, a rotary shaft, means operated by said shaft for automatically varying said stopping means, and a ribbon vibrator operated by said parts.

6. In a typewriting machine, the combination of a ribbon vibrator, means for operating said vibrator, said means including two parts having relative motion and means for imparting to said two parts a definite extent of relative motion at each operation, stopping means cooperating with said parts to distribute such relative motion between said parts, and means for progressively adjusting said stopping means in order to utilize the surface of the ribbon widthwise.

7. In a typewriting machine, the combination of a ribbon vibrator, a lever for operating said ribbon vibrator, a second lever, means for imparting at each operation a definite extent of relative motion to said levers, variable stopping means for variably distributing such motion between the two levers and thus causing a variable operation of the vibrator, a shaft, and a sleeve adjustable along said shaft and controlling said stopping means; said sleeve having an eccentric part and concentric parts of different diameters.

8. In a typewriting machine, the combination of a ribbon vibrator, two parts for controlling said vibrator, means for imparting to said two parts a definite extent of relative motion at each operation, and stopping means adjustable in the general direction of such relative motion to variably distribute such relative motion between said two parts.

9. In a typewriting machine, the combination of a vibrator, means for operating said vibrator including two parts, means for giving to said parts a definite extent of relative motion at each operation, two stops, one for each of said parts, and means for adjusting said stops in unison.

10. In a typewriting machine, the combination of a ribbon vibrator, two levers for controlling said vibrator, means for imparting to said two levers a definite extent of relative motion at each operation, a pivoted device, and a stopping means for said

levers carried by said pivoted device and adjustable by an adjustment of said pivoted device in substantially the direction of said relative motion.

11. In a typewriting machine, the combination of a ribbon vibrator, actuating devices therefor comprising two connected parts, stopping means with which both of said parts cooperate at each vibrating operation, and means for automatically varying said stopping means.

12. In a typewriting machine, the combination of a ribbon vibrator, actuating devices therefor comprising two connected parts, stopping means with which both of said parts cooperate at each vibrating operation, a ribbon driving shaft, and means connected with said shaft for automatically varying said stopping means.

13. In a typewriting machine, the combination of a ribbon vibrator, actuating devices therefor comprising two connected levers, stopping means with which both of said levers coact, a ribbon driving shaft, and connections between said stopping means and said shaft.

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 July, A. D. 1912.

ROBERT H. STROTHER.

Witnesses:

CHARLES E. SMITH,

M. F. HANNWEBER.

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