

1,040,272.

4 SHEETS--SHEET 1.

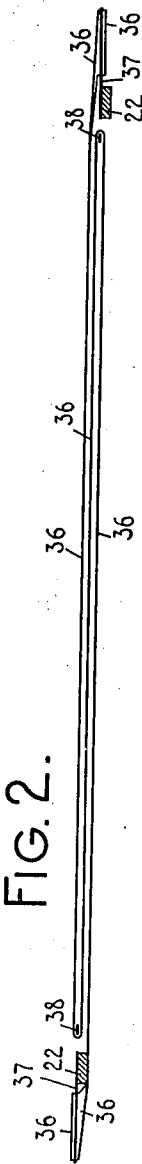


Fig. 1.

FIG. 2.

WITNESSES.

E. M. Wells.
-mwPool

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By Jacob Felbel

HIS ATTORNEY

1,040,272.

Patented Oct. 8, 1912.
 4 SHEETS—SHEET 2.

FIG. 4.

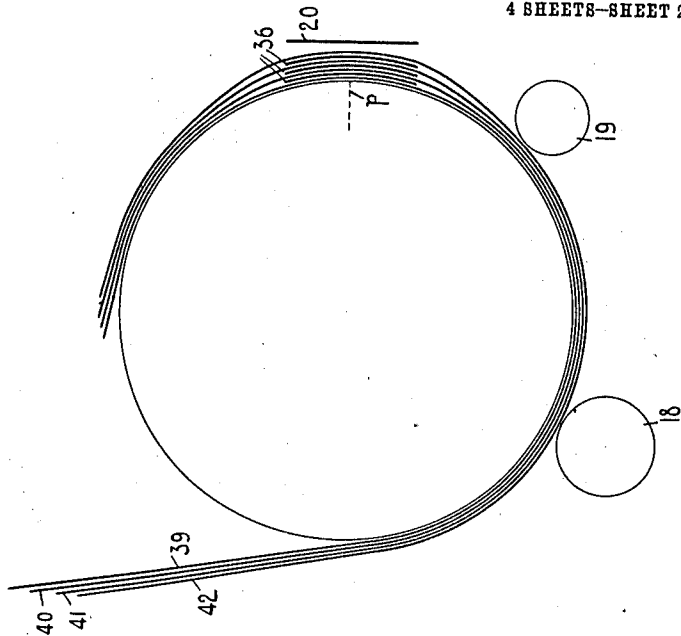
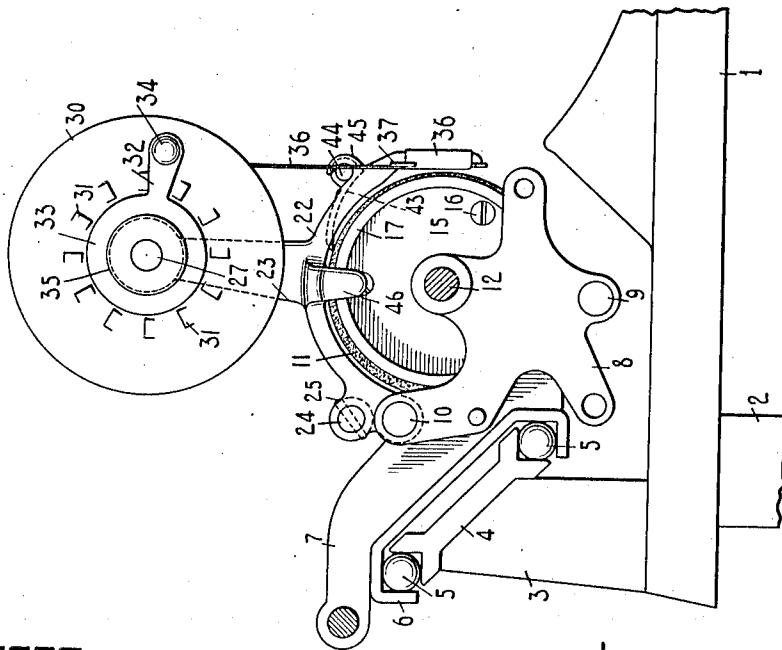


FIG. 3.



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4 SHEETS—SHEET 3.

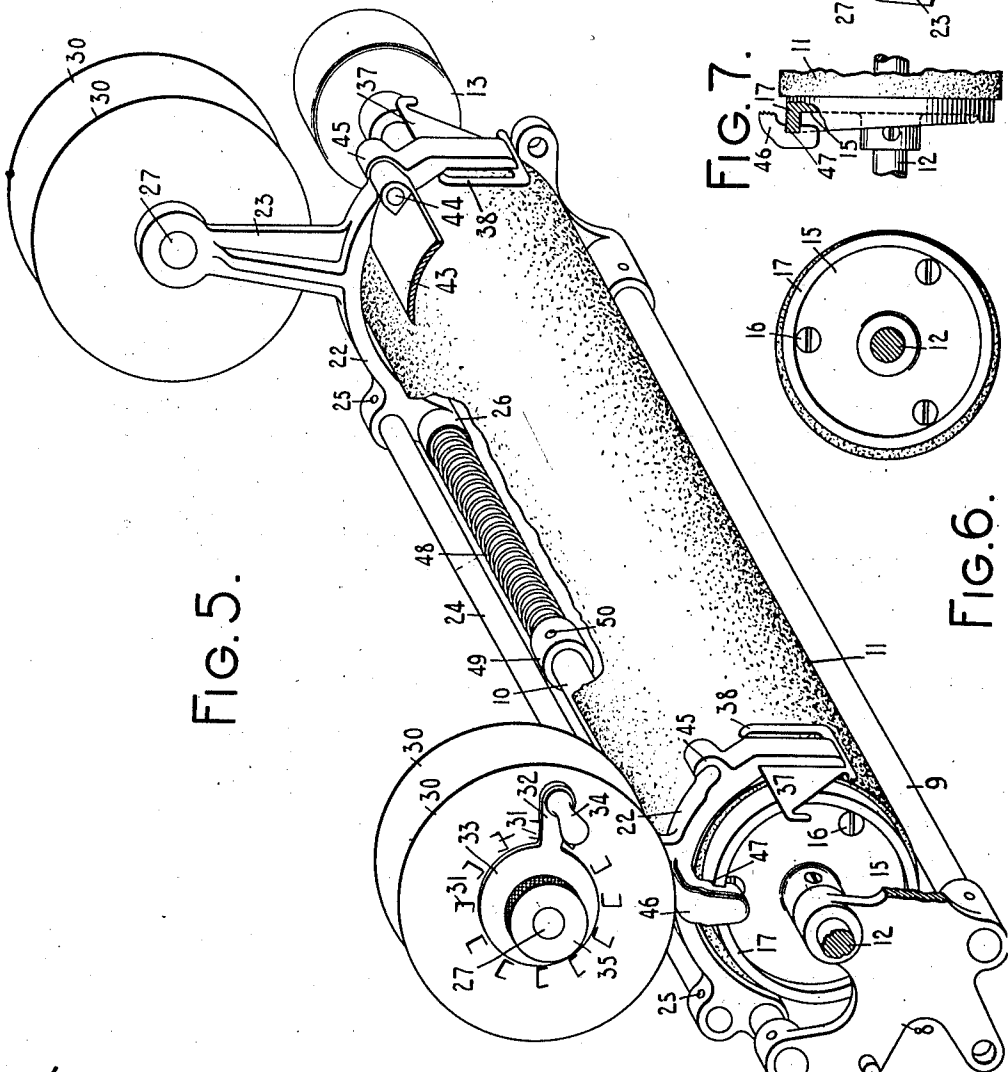


FIG. 5.

FIG. 6.

FIG. 7.

FIG. 8.

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H. A. CARHART.
TYPE WRITING MACHINE.
APPLICATION FILED JAN. 23, 1911.

1,040,272.

Patented Oct. 8, 1912.
4 SHEETS—SHEET 4.

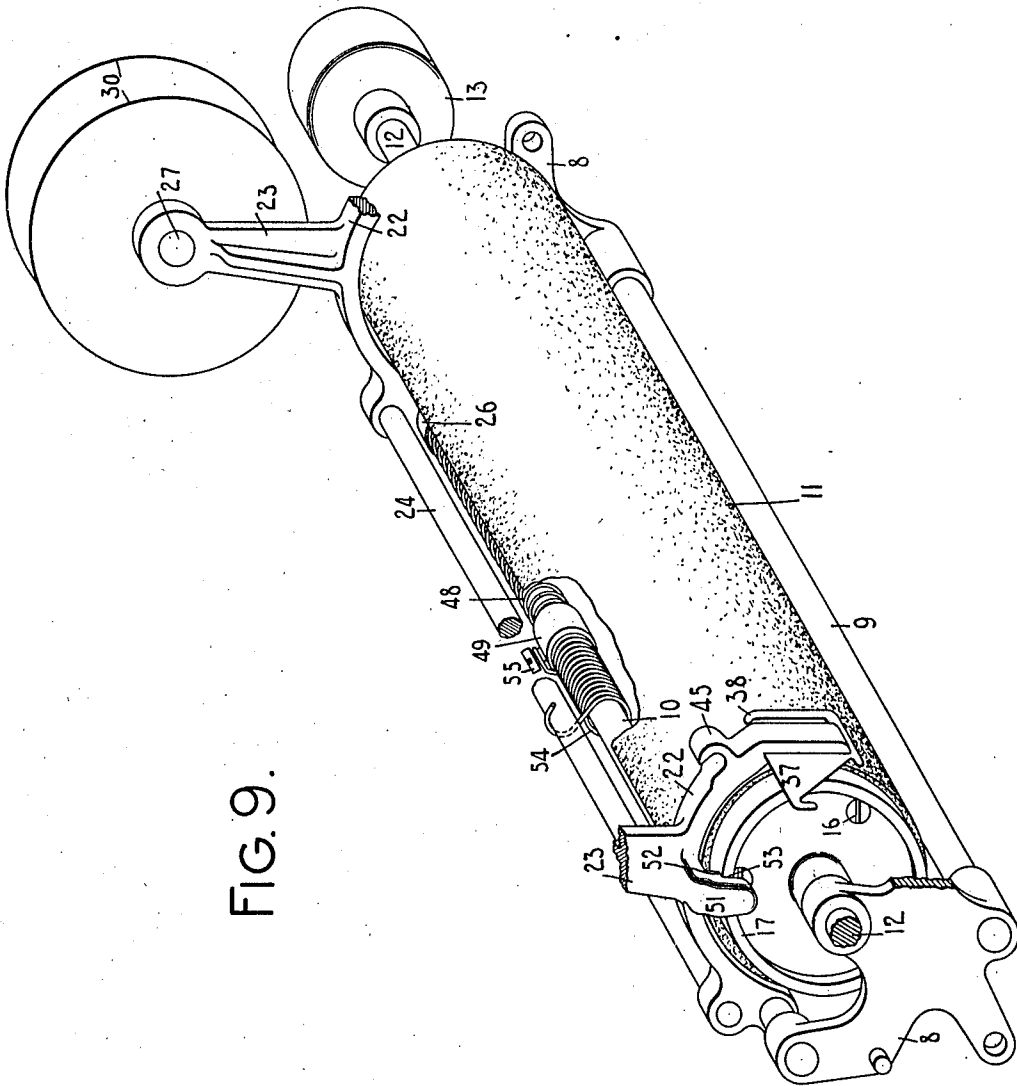


FIG. 9.

WITNESSES:

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UNITED STATES PATENT OFFICE.

HERBERT A. CARHART, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE SMITH PREMIER TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,040,272.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Application filed January 23, 1911. Serial No. 604,100.

To all whom it may concern.

Be it known that I, HERBERT A. CARHART, citizen of the United States, and resident of Syracuse, 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 inking mechanism for typewriting machines and more particularly to mechanism for duplicating inked copies of typewritten work by means of a ribbon supplementary to the ordinary or main ribbon of the machine.

The general object of my invention is to provide improved mechanism of the character specified.

In carrying out this general object one of the more specific objects sought and obtained by the present invention is an improved carriage carried ribbon mechanism which is simpler and more efficient than those heretofore provided.

Another object is the provision of improved means for mounting and guiding the supplementary ribbon.

Another object is to provide improved means for feeding the supplementary ribbon.

Another object is the provision of means for varying the point of impact of the types with the printing portion of the ribbon by moving said portion both lengthwise and widthwise of the printing line.

Other objects will hereinafter appear.

To the above 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 is shown as applied to the No. 10 Smith Premier typewriter but it is to be understood that said invention may be adapted to other styles of typewriting machines.

In the present instance I have provided a supporting frame which is arranged on the platen frame or carrier and carries a pair of supplementary ribbon spools arranged at the ends of the platen and above the same, said spools being co-axial and their common axis being parallel with the platen axle. The supplementary ribbon is led

downward from its spools or carriers transversely of the platen and passes over turning bars on said supporting frame, said turning bars directing the ribbon inward lengthwise of the platen and so that the printing portion extends along the same over the printing line. This latter portion of the ribbon is guided or looped over upright fingers so that there are a plurality of plies of the ribbon extending along the platen, in the present instance three plies or printing surfaces of ribbon. The supporting frame is controlled by cams on the platen and by a spring so that during the turning of the platen said supporting frame and the parts carried thereby including the printing plies or surfaces of the ribbon are automatically moved lengthwise of the platen and transversely thereof so as to vary the normal relationship between the ribbon plies and the printing point and thus change the points at which the impacts of the types are received by the ribbon. Means are also provided for turning the ribbon spools by hand so that the ribbon may be fed lengthwise back and forth between them when it is found desirable to present fresh printing surfaces of the ribbon to the types.

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

Figure 1 is a fragmentary front elevation of the platen frame or carrier of a No. 10 Smith Premier typewriting machine embodying my invention, the regular ribbon vibrator and its support being also shown. Fig. 2 is a diagrammatic plan view showing the course of the printing plies of the supplementary ribbon. Fig. 3 is a fragmentary left-hand side elevation partly in section showing the upper portion of the machine aforesaid. Fig. 4 is a diagrammatic side elevation showing the relationships between the ribbons and work sheets. Fig. 5 is a fragmentary perspective view showing the platen frame and platen and my invention in connection therewith. Fig. 6 is a left-hand end view of the platen, the platen axle being shown in section. Fig. 7 is a fragmentary front elevation of the left-hand end portion of the platen and the connection between the same and the supplementary ribbon supporting frame. Fig. 8 is a sectional view of

one of the supplementary ribbon spools. Fig. 9 is a fragmentary perspective view of a platen and platen frame embodying a modified form of my invention.

As appears from Fig. 3 of the drawing the main frame of the machine comprises a top plate 1 mounted on frame parts or posts 2, one of which is shown. Standards 3 on the top plate support an inclined stationary track way 4 which coöperates through anti-friction balls 5 with a slide bar 6 comprised in a carriage truck which further includes end bars 7. Said truck carries a detachable platen frame or carrier 15 which as best shown in Figs. 1 and 5 comprises end bars 8 connected by parallel rods 9 and 10, the rod 9 extending along a platen 11 under the same and the rod 10 being arranged behind the platen. Said platen is provided with an axle 12 which has bearings on the end bars 8, said axle being provided at its end with finger wheels 13. Connected with the right-hand end of the platen is a line spacing ratchet wheel 14 with which is adapted to coöperate line space actuating devices of the usual or other suitable style. The left end of the platen is provided with a platen head 15 which is secured in place by screws 16. Said platen head as appears from Figs. 6 and 7 has a flange or rim 17 which is eccentric to the platen axle 12. Also, as shown in Fig. 7 the depth of the rim or flange varies so that the distance from the left-hand plane face of the platen to the left face of the rim or flange 17 is greater or less according as different parts of the rim are considered. The platen may be equipped with the usual paper feeding devices including feed rollers 18 and 19 diagrammatically shown in Fig. 4.

A main ribbon 20 is supported on a vibratory carrier 21 arranged at the front side of the platen and adapted to be moved up and down to cover and uncover the printing point on the platen with the printing portion of the ribbon 20, the moving or vibrating mechanism being preferably of the usual character.

With the exception of the left-hand platen head 15 the parts above described are or may be of the construction of the No. 10 Smith Premier machine. Further it will be understood that the machine is equipped with printing instrumentalities of suitable character, such as those of the typewriting machine aforesaid, and that the printing takes place at the front side of the platen, the printing point being designated as *p* (Figs. 1 and 4) and the printing line as *l* (Fig. 1).

The supporting frame for the supplementary ribbon comprises arms 22 which curve over the top of the platen near the ends thereof and are provided with upright standards 23 (Figs. 1, 3 and 5). The rear portions of said arms are connected by a

cross rod or bar 24, said rod being pinned at 25 to lugs on said arms 22, the arms 22 and the rod 24 forming a rigid frame. The rear end portions of the arms 22 terminate in hubs 26 which bear loosely on the frame rod 10 so that the supporting frame may turn slightly on said rod as an axis and also may move endwise along said rod to a limited extent.

Secured to the upper end of each standard 23 is a laterally extending stud 27 (Figs. 5 and 8), said studs serving as axles for the supplementary ribbon spools. Each stud has an enlarged cylindrical body 28, the portions at each end of the body being reduced in diameter. The outer end portion of each stud is threaded while the inner end portion enters a hole near the top of the associate standard 23 and is upset or spread at its end so as to clamp or rivet the stud in place thereon. Each supplementary ribbon spool bears rotatably on the body portion 28 of the associate stud, and comprises a hub 29 and flanges 30, the outer flange being cut or punched to provide a series of lateral projections or tongues 31 for coöperation with the stem 32 of an actuating device which further comprises an annular portion 33 bearing loosely on the threaded end of the stud. The stem or arm 32 extends radially from the annulus 33 and has projecting laterally from it near its end a finger piece or handle 34 by which it may be turned. A thumb nut 35 is arranged on the threaded portion of each stud 27 and operates when tightened against the actuating device 32, 33 to clamp it and the associate ribbon spool so that they will be prevented from rotating.

It will be observed from Fig. 8 that the spool and its actuating device are clamped between the thumb nut and the upper end or boss-like portion of the standard 23. It will be understood that when the thumb nut is loosened slightly the spool and its actuating device are free to rotate, so that when said actuating device is turned by hand in one direction its stem 32 will engage with the projecting end of one of the tongues 31 and will thus take up the spool and turn it by winding the supplementary ribbon wound on said spool. Of course the other spool should be unclamped at the same time so that it may turn to let the ribbon be drawn off. Said supplementary ribbon 36 is wound on the spool hubs 29 between the flanges 30 and passes downward from said spools toward the platen where it is guided by sets of guiding and controlling devices, each set comprising a diagonal turning device or bar 37 and an upright finger 38. Each turning bar and its associate finger is preferably formed from a single piece of sheet metal which is suitably secured to the forward end portion of the associate supporting arm 22. As shown in Fig. 1 the

ribbon passes downward at the front side of the left-hand spool and at the rear of the right-hand spool, being guided at the front side of the platen and in a line with the printing point by the diagonal turning bars 37 which extend laterally outward from the arms 22. These turning bars change the course of the ribbon from an up and down one transverse of the platen to a horizontal direction longitudinal of the platen. The course of the ribbon is best followed in connection with the diagrammatic plan shown in Fig. 2 taken in connection with Fig. 1. The ribbon is led downward from the right-hand spool in front of the right-hand turning bar 37 and turns inward at right angles to its former course, extending behind said turning bar and lengthwise of the platen so as to cover the printing line *l* on the front face thereof. At the left end of the platen the ribbon is guided over and around the upright finger or guide 38 which is secured to the left-hand arm 22 and thence the ribbon is returned toward the right, the second ply covering the first ply and at the right-hand end being looped over the upright finger or guide 38 secured to the right-hand arm 22. Passing over and around the right-hand finger 38 the ribbon is again extended along the platen over the two inner plies and passes over the front of the left-hand turning bar 37 and thence upward behind the same to the left-hand spool. By this construction and arrangement three plies or folds of auxiliary ribbon are retained covering the printing point and from them three inked copies may be taken on interleaved work sheets, as will be apparent from an inspection of Fig. 4. In this figure, four sheets are shown numbered 39, 40, 41 and 42, these sheets being preferably drawn from rolls or webs at the rear of the platen, though, of course, they may be detached sheets. The outer sheet 42 passes around the platen 11 between the same and the feed rolls 18 and 19 and is adapted to receive imprints from the main ribbon 20, shown in printing position. The next sheet 41 passes between the outermost and middle plies of the ribbon 36 and receives imprints from the outermost ply. The sheet 40 receives imprints from the middle ply of the ribbon 36 while the innermost sheet 39 is printed from the inner ply of the ribbon 36.

As stated, the work sheets are preferably wound in rolls; and completed written portions may be detached by means of a severing device or blade 43 arranged lengthwise of the platen and at the front upper side thereof. The blade 43 is provided at its ends with pintles 44 which bear in open mouthed seats 45 on the arms 22, thus pivotally connecting the blade with the arms. The four work sheets pass between the removable blade 43 and the platen and the

written portions thereof may be severed by pulling them forward over the blade and against the rear sharpened edge of the same. The blade 43 also serves as a guide or controlling device for the work sheets after they have passed the printing point.

It will be understood that the three printing plies of the ribbon 36, that is, the three parallel portions which extend along the platen and are retained over the printing line thereof, will remain in use as long as the ribbon spools are held clamped by the thumb nuts 35. When the ink becomes exhausted from these printing plies, fresh portions may be presented for use by loosening the thumb nuts 35 and turning one of the spools by means of its associate actuating device so as to wind the exhausted portion of the ribbon thereon and unwind a corresponding fresh portion from the other ribbon spool; after which the spools may be re-locked or re-clamped by tightening the thumb nuts 35. Further, it will be apparent that this renewing operation may be repeated at intervals until the printing surface of the entire ribbon has been exhausted. This winding of the ribbon moves it longitudinally independently of its guiding devices and of the supporting frame which remain unaffected during such longitudinal movements.

In order to prolong the life of the ribbon and more thoroughly exhaust the surface of the printing plies than has heretofore been possible, I provide means for automatically moving the three plies as a whole, and without changing their inter-relationship, both lengthwise of the printing line and also transversely thereof. In the present instance this results in a variation in the normal relationship between the set of ribbon plies and the printing point on the platen, the ribbon plies being shifted progressively lengthwise of the platen and also simultaneously shifted progressively transversely thereof, so that successive lines of imprints will not take place over and over again on the same portions of the ribbon but, on the contrary, the imprints of successive lines will be slightly to one side of preceding corresponding imprints and will also be slightly above or below such preceding imprints. This result is obtained in the present instance by mounting the supporting frame, comprising the arms 22 and their standards 23 and the rod 24, in such a way that said frame may be moved back and forth lengthwise of the platen and may also be given an up and down movement transversely of the platen and the printing line. In other words the supporting frame and the parts it carries are adapted to be reset bodily at intervals. These movements of the supporting frame are communicated automatically during

rotary movements given to the platen as when the same is being advanced for spacing between lines of writing. This result is obtained by providing an operative mechanical connection between the platen and the supporting frame, and the spools and guiding devices carried by said frame.

In the preferred form of the invention shown in Figs. 1 to 8, inclusive, the means for communicating automatic movements to the supporting frame from the platen comprise an angular finger 46 which extends laterally outward from the left-hand arm 22 at about the middle of the length of said arm and at the top of the platen. Said finger 46 is bent downward at right angles so as to provide a vertical portion and the inner face of said vertical portion is formed with a slot 47 which fits over and embraces the flange 17 of the platen head 15 as will be understood from Figs. 3, 5 and 7. Thus the supporting frame is positively connected to the platen and is held from crosswise displacement thereby. A coiled expansible spring 48 (Fig. 5) surrounds the frame rod 10 and is confined between the right-hand hub 26 of the supporting frame and a collar 49 pinned at 50 to said rod 10. Said spring tends constantly to press the supporting frame toward the right, rightward movement of said frame being controlled, however, by the co-action between the slotted finger 46 and the flange 17. It will be understood that said spring maintains the bottom of the slot 47 against the left-hand edge of the flange 17, and further that the engagement of the slotted finger with the flange will prevent independent upward movement of the supporting frame on its pivot 10. As has been stated the depth of the flange 17 varies. In the relationship of the parts shown in Fig. 7 the finger 46 is engaged with the flange at its deepest part so that the supporting frame with which said finger is integral has been forced or cammed leftward to the limit of its movement against the spring 48. I have not shown means for positively limiting the extent of leftward movement of said supporting frame, but such means may, of course, be provided, if desired. If now the platen be rotated, bringing the lower portion of the flange 17 into coöperation with the finger 46, then the spring 48 will operate to move the supporting frame a corresponding distance rightward relatively to the platen, thus resulting in a like longitudinal movement of the printing plies of the supplementary ribbon 36 lengthwise of the platen. Rightward movement of the supporting frame and ribbon plies will continue until the lowest portion of the flange 17 (that portion shown at the bottom of Fig. 7) engages with the finger 46. Thereafter fur-

ther rotary movements of the platen will bring successively higher parts of the flange 17 into co-action with the finger 46, thus resulting in corresponding leftward movements of the supporting frame and the plies of ribbon carried thereby. In other words, the supporting frame, the ribbon spools and the printing plies of the ribbon will be moved progressively back and forth lengthwise of the platen during rotary movements thereof. During these progressive bodily movements the inter-relationship among the various ribbon plies will not vary, although their relationship with the printing point will be varied. Further it will be understood that, owing to the eccentricity of the flange 17 with respect to its axis of rotation, the finger 46 which fits over and is controlled by said flange will be moved toward and away from said axis of rotation, thus resulting in an up and down movement of the supporting frame, ribbon spools and ribbon plies, such that the ribbon plies will be moved step by step during line spacing operations first in one direction as upward, then downward, then upward again, and so on. As a result of this automatic movement of the printing plies of the ribbon the entire surface of said plies will be quite thoroughly exhausted of ink so that a great many copies may be printed before it becomes necessary to supply fresh inking surfaces by rotating the spools. It will be understood that though the lengthwise movements of the ribbon plies and the widthwise movements thereof have been separately described, nevertheless, these movements take place simultaneously. The eccentric flange 17 with its inclined face serves in effect as a plurality of cams operating to cam the supporting frame longitudinally of the platen and platen frame and also to cam it in a direction transversely thereof.

The paper being preferably supplied in roll form it is only at infrequent intervals that it is necessary to interleave the work sheets and the ribbon plies and I find, in practice, that the easiest and most expeditious way of performing this operation is by removing one of the ribbon spools and unthreading the ribbon from its guides and supports comprising the oblique turning bars 37 and upright fingers 38. Then the inner work sheet 39 is drawn up around the front of the platen with one hand while the operator holds the detached spool, as the left-hand spool, with the other. Then the inner ply of the ribbon is passed along the platen over the sheet 39, said ply passing from the right-hand turning bar 37 over and around the left-hand finger 38. Then the next sheet 40 is drawn up around the platen after which the ribbon is passed back from the left-hand finger 38 to the

right-hand finger 38. Thereupon the next sheet 41 is drawn up and the ribbon passed back over it from the right-hand finger 38 to the left-hand turning bar 37. Next the outermost sheet is passed upward and the left-hand ribbon spool replaced on its support. This mode of inter-leaving work sheets and the ribbon plies has the merit of rapidity and also avoids direct handling of the ribbon and consequent soiling of the hands.

Various changes may be made in the mode of carrying out my invention without departing from some of its principles. One example of such changes is illustrated in Fig. 9 which shows a modified construction wherein the slotted finger 46 is replaced by a finger 51 which, instead of being formed with a slot, is undercut so as to provide a substantially horizontal face 52 which engages the periphery of the flange 17, while the vertical face 53 of the undercut portion co-acts with the left-hand face of the flange 17 and is maintained in contact therewith by the spring 48 which tends constantly to force the supporting frame rightward lengthwise of the platen as heretofore. The face 52 is maintained in contact with the periphery of the flange 17 by a spring 54 which is coiled around the rod 10 at the left of the collar 49, one end of said spring being hooked around a headed screw 55 secured to said collar while the opposite end is hooked around the rod 24 of the supporting frame, so that the spring 54 tends constantly to press the supporting frame forward and downward around its pivotal axis. It will be apparent that by means of the spring 54 and the eccentric flange 17 the ribbon plies will be caused to move up and down transversely of the platen and the printing line while the spring 48 and the left-hand face of the flange 17 will operate as heretofore to cause progressive movements of the ribbon plies lengthwise of the platen.

Other changes of construction may be made within my invention and parts of it may be employed without other parts.

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

1. In a typewriting machine, the combination of a platen carrier, a platen, means for retaining a ribbon to cover the printing point on the platen, and means on said platen carrier for moving said retaining means to vary the normal relationship of the ribbon with the printing point on the platen, the variation being in a direction both lengthwise of the printing line and also crosswise thereof.

2. In a typewriting machine, the combination of a platen, a platen frame, means mounted on said platen frame for retaining a ribbon opposite the printing point, and

means on said platen frame for varying the normal relationship between said retaining means and the printing point on the platen.

3. In a typewriting machine, the combination of a platen, a platen frame, devices mounted on said platen frame for retaining a ribbon opposite the printing point, and means for varying the normal relationship between said retaining devices and the printing point on the platen, said means being automatically operative independently of movement of said platen frame.

4. In a typewriting machine, the combination of a rotary platen, a platen frame, devices mounted on said platen frame for retaining a ribbon opposite the printing point, and means for varying the relationship between said devices and the printing point on the platen, said means operating automatically during turning movements of the platen.

5. In a typewriting machine, the combination of a platen, means for retaining the ribbon normally covering the printing point on the platen, and means for moving said retaining means bodily both transversely and lengthwise of the platen so as to vary in two directions the normal relationship between the ribbon and the printing point on the platen, said means operating independently of letter space and return movements of said platen.

6. In a typewriting machine, the combination of a platen, ribbon guiding means, and operative connections directly connecting said ribbon guiding means and the platen whereby the normal relationship between the printing point on the platen and the ribbon guiding means is automatically varied.

7. In a typewriting machine, the combination of a rotary platen, ribbon guiding means, and connections between said ribbon guiding means and said platen for moving said ribbon guiding means when the platen is turned.

8. In a typewriting machine, the combination of a platen, a platen frame, ribbon guiding means on said platen frame, and operative mechanical connections between said ribbon guiding means and said platen for moving said guiding means relatively to said platen frame and thus varying the relationship of the printing portion of the ribbon with the printing point.

9. In a typewriting machine, the combination of a platen, ribbon spools, and operative mechanical connections between said platen and said ribbon spools for bodily moving said ribbon spools from the platen.

10. In a typewriting machine, the combination of a platen, ribbon spools, a ribbon spool support, and operative mechanical connections directly connecting said support and said platen.

11. In a typewriting machine, the combination of a platen, ribbon spools, a ribbon guide, a support for said spools and said guide, and operative mechanical connections directly connecting said support and said platen.

12. In a typewriting machine, the combination of a platen carrier, a platen, ribbon spools, a ribbon guide, a movable support mounted on said platen carrier for said spools and said guide, and means for resetting said support to change its normal relationship with the platen.

13. In a typewriting machine, the combination of a platen, a ribbon guide normally maintaining the ribbon covering the printing point, and means operating automatically independently of letter space movements of the platen to move said guide progressively lengthwise of the platen.

14. In a typewriting machine, the combination of a platen, a ribbon guide normally maintaining the ribbon covering the printing point, the position of said guide at the printing moment being the same as its normal position, and means operating automatically to move said guide progressively both lengthwise and transversely of the platen.

15. In a typewriting machine, the combination of a platen, a ribbon guide normally maintaining the ribbon covering the printing point, the position of said guide at the printing moment being the same as its normal position, and means operating automatically to move said guide progressively back and forth both lengthwise and widthwise of the platen.

16. In a typewriting machine, the combination of a platen, means for clamping the printing portion of the ribbon against longitudinal advance movement, and means for varying the relationship between the printing portion of the ribbon and the printing point while the clamping means remains effective.

17. In a typewriting machine, the combination of a platen, ribbon spools, means for preventing rotation of said ribbon spools, and means for varying the relationship between the printing portion of the ribbon and the platen while said spools are prevented from rotating and while the same relationship is maintained between the printing portion of the ribbon and said varying means.

18. In a typewriting machine, the combination of a platen, ribbon spools, means for preventing rotation of said ribbon spools, and means for moving said spools bodily to change the relationship of the printing portion of the ribbon to the printing point on the platen, the feeding movement of the ribbon from spool to spool being suspended during said change in relationship.

19. In a typewriting machine, the combination of a platen, ribbon guiding devices between which the printing portion of the ribbon extends, said printing portion normally covering the printing point on the platen, means for maintaining an unvarying relationship between the ribbon and said devices, and means for moving said devices to vary the normal relationship between the printing portion of the ribbon and the printing point on the platen.

20. In a typewriting machine, the combination of a platen, ribbon guiding devices spaced apart, the ribbon extending along the platen over the printing point from one device to the other, means for holding the ribbon in unvarying relationship with said guiding devices, means for moving said guiding devices to vary the normal relationship between the printing portion of the ribbon and the printing point on the platen, and means for varying the relationship between the ribbon and said guiding devices.

21. In a typewriting machine, the combination of a platen, guiding means for maintaining a plurality of ribbon plies opposite the printing point on the platen, and means for varying the normal relationship between said plies and the printing point on the platen while the relationship between said guiding means and said plies remains the same.

22. In a typewriting machine, the combination of a platen, means for maintaining a plurality of ribbon plies opposite the printing point on the platen, and means for varying the normal relationship between said plies and the printing point on the platen without changing the inter-relationship among said plies.

23. In a typewriting machine, the combination of a platen, guiding devices for maintaining a plurality of plies of ribbon in parallelism and covering the printing point, and means for moving said devices to change the relationship of said plies with the printing point on the platen, the relationship between said plies and said guiding devices remaining the same.

24. In a typewriting machine, the combination of a platen, guiding devices for maintaining a plurality of plies of ribbon in parallelism and covering the printing point, means for moving said devices to change the relationship of said plies with the printing point on the platen, the plies remaining in the same relationship to each other after the movements of said devices as prior thereto, and means for moving the ribbon longitudinally independently of said devices.

25. In a typewriting machine, the combination of a platen, ribbon spools, guiding devices for maintaining a plurality of plies of

ribbon in parallelism and covering the printing point, means operative on said spools to prevent change in the inter-relationship among said plies of ribbon, means for moving said devices to change the relationship of said plies with the printing point on the platen, and means for turning said ribbon spools to move the ribbon longitudinally independently of said devices.

26. In a typewriting machine, the combination of a platen, means for retaining a plurality of ribbon plies opposite the printing point on the platen, and means operating automatically to vary the normal relationship between said plies and the printing point on the platen without changing the inter-relationship among said plies.

27. In a typewriting machine, the combination of a platen, means for retaining a plurality of ribbon plies opposite the printing point on the platen, and means operating automatically to vary the normal relationship between said plies and the printing point on the platen without changing the inter-relationship among said plies, said plies being moved together simultaneously both lengthwise of the platen and crosswise of the printing line thereon.

28. In a typewriting machine, the combination of a platen, a platen frame, means mounted on said platen frame for retaining a plurality of plies of ribbon opposite the printing point, means for preventing change in the inter-relationship of said plies, and means for varying the normal relationship between said retaining means and the printing point on the platen.

29. In a typewriting machine, the combination of a platen, a platen frame, means mounted on said platen frame for retaining a plurality of plies of ribbon opposite the printing point, means for preventing change in the inter-relationship of said plies, and means operating automatically to change the relationship between said retaining means and the printing point on the platen.

30. In a typewriting machine, the combination of a platen, means for retaining a plurality of ribbon plies opposite the printing point on the platen, and operative connections between the platen and said retaining means for automatically moving said means when the platen is turned, said means operating to shift the ribbon plies both lengthwise of the platen and transversely thereof.

31. In a typewriting machine, the combination of a platen, means for automatically shifting a plurality of ribbon plies in a direction both lengthwise of the platen and simultaneously in a direction crosswise of the printing line on the platen.

32. In a typewriting machine, the combination of a platen, a platen frame, a pair

of ribbon spools mounted on said platen frame, said ribbon spools carrying a single ribbon, and means for guiding a plurality of plies of said ribbon in parallelism lengthwise of the platen and covering the printing point thereon.

33. In a typewriting machine, the combination of a platen; a platen frame; a supporting frame on said platen frame, a pair of ribbon spools on said supporting frame carrying a single ribbon, and guiding means on said supporting frame for guiding a plurality of plies of said ribbon in parallelism lengthwise of the printing line on the platen.

34. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame on said platen frame, a pair of ribbon spools on said supporting frame carrying a single ribbon, and means on said supporting frame for retaining a plurality of plies of said ribbon opposite the printing point.

35. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame on said platen frame, a pair of ribbon spools on said supporting frame, means on said supporting frame for retaining a plurality of plies of ribbon opposite the printing point, means for preventing change in the inter-relationship of said plies, and means for changing the normal relationship between said supporting frame and the platen.

36. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame on said platen frame, a pair of ribbon spools on said supporting frame carrying a single ribbon, means on said supporting frame for retaining a plurality of plies of said ribbon opposite the printing point, and means operating automatically to change the relationship between said supporting frame and the platen.

37. In a typewriting machine, the combination of a platen; a platen frame; a supporting frame on said platen frame; a pair of ribbon spools on said supporting frame; means on said supporting frame for retaining a plurality of plies of ribbon opposite the printing point, and means operating automatically to change the relationship between said supporting frame and the platen, said last recited means comprising a cam on the platen, and a spring co-acting with the supporting frame.

38. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame on said platen frame, a pair of ribbon spools on said supporting frame, means on said supporting frame for retaining a plurality of plies of ribbon opposite the printing point, and means operating automatically to change the relationship between said supporting frame and the platen,

said last recited means comprising cams on the platen and a part on said supporting frame that coöperates with said cam.

39. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame on said platen frame, a pair of ribbon spools on said supporting frame, means on said supporting frame for retaining a plurality of plies of ribbon opposite the printing point, and means operating automatically to change the relationship between said supporting frame and the platen, said last recited means comprising an eccentric flange on said platen, said flange having an inclined face, and a slotted finger on said supporting frame engaging said flange.

40. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame on said platen frame, a pair of ribbon spools on said supporting frame carrying a single ribbon, means on said supporting frame for retaining a plurality of plies of said ribbon opposite the printing point, and means operating automatically to change the relationship between said supporting frame and the platen, said last recited means comprising an eccentric flange on said platen, said flange having an inclined face, a slotted finger on said supporting frame engaging said flange, and a spring on said platen frame, said spring operating on said supporting frame.

41. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame pivotally connected with said platen frame, a pair of ribbon spools on said supporting frame, guiding devices on said supporting frame, a cam on said platen, and connections between said cam and said supporting frame.

42. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame thereon, a pair of ribbon spools on said supporting frame, means on said supporting frame for guiding a plurality of ribbon plies lengthwise of the platen, paper feeding means coöperative with the platen for feeding a plurality of sheets of paper, the sheets being interleaved with the plies of ribbon, and a detachable pivotally mounted paper severing device on said supporting frame.

43. In a typewriting machine, the combination of a platen, a platen frame, a supporting frame thereon, a pair of ribbon spools on said supporting frame, means on said supporting frame for guiding a plurality of ribbon plies lengthwise of the platen, paper feeding means coöperative with the platen for feeding a plurality of sheets of paper, the sheets being interleaved with the plies of ribbon, and a paper severing device on said supporting frame, said device serving also as a guide for the paper.

44. In a typewriting machine, the combina-

tion of ribbon spool bearings, ribbon spools rotatable on said bearings, the flanges of said spools being provided with projections, separate hand actuated devices coöperative with said projections for turning said ribbon spools, and means co-acting with said devices and with said bearings to hold said ribbon spools clamped in fixed relationship with said bearings.

45. In a typewriting machine, the combination of ribbon spool supporting studs, ribbon spools rotatable on said studs, the flanges of said spools having projections, separate hand actuated devices coöperative with said projections for turning said ribbon spools, and means co-acting with said devices and with said studs to hold said ribbon spools clamped in fixed relationship with said studs, said studs having threaded portions and said clamping means comprising thumb nuts co-acting therewith.

46. In a typewriting machine, the combination of ribbon spools each comprising a flange having a plurality of lateral projections, bearings on which said ribbon spools are rotatable, devices for rotating said ribbon spools, said devices being rotatable by hand on said bearings and co-acting with one or another of said projections, and means for maintaining fixed relationship between said spools and said devices.

47. In a typewriting machine, the combination of ribbon spools each comprising a flange having a plurality of lateral projections, bearings on which said ribbon spools are rotatable; devices for rotating said ribbon spools, said devices being rotatable by hand on said bearings and co-acting with one or another of said projections, and means for clamping said ribbon spools and said devices in fixed relationship with said bearings.

48. In a typewriting machine, the combination of a platen; a platen frame comprising a rod extending longitudinally of the platen in rear thereof; a supporting frame comprising a pair of arms mounted on said rod and extending forward over the platen, said arms being joined by a connecting bar and being provided with upright standards; means for securing said supporting frame to said platen, ribbon spools on said standards; means for turning said ribbon spools; and sets of ribbon guiding devices secured to said arms, each set comprising a turning bar and a finger.

49. In a typewriting machine, the combination of a platen; a platen frame comprising a rod extending longitudinally of the platen in rear thereof, a supporting frame comprising a pair of arms pivoted on said rod and extending forward over the platen, said arms being joined by a connecting bar and being provided with upright standards, ribbon spools on said standards, means for

turning said ribbon spools, means for clamping said ribbon spools to said standards, sets of ribbon guiding devices secured to said arms, each set comprising a turning bar
5 and a finger; and mechanism for connecting said supporting frame with said platen to move said frame when said platen is turned.

Signed at Syracuse, in the county of Onondaga, and State of New York, this 19th day of January, A. D. 1911.

HERBERT A. CARHART.

Witnesses:

M. J. GALLAVIN,
L. G. ABBOTT.