

TYPE WRITING MACHINE.
APPLICATION FILED JAN. 20, 1911.

3 SHEETS—SHEET 1.

FIG. 2.

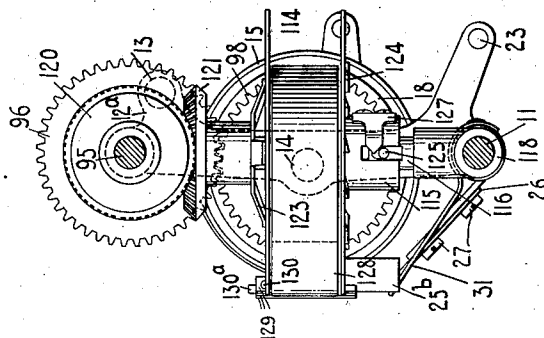
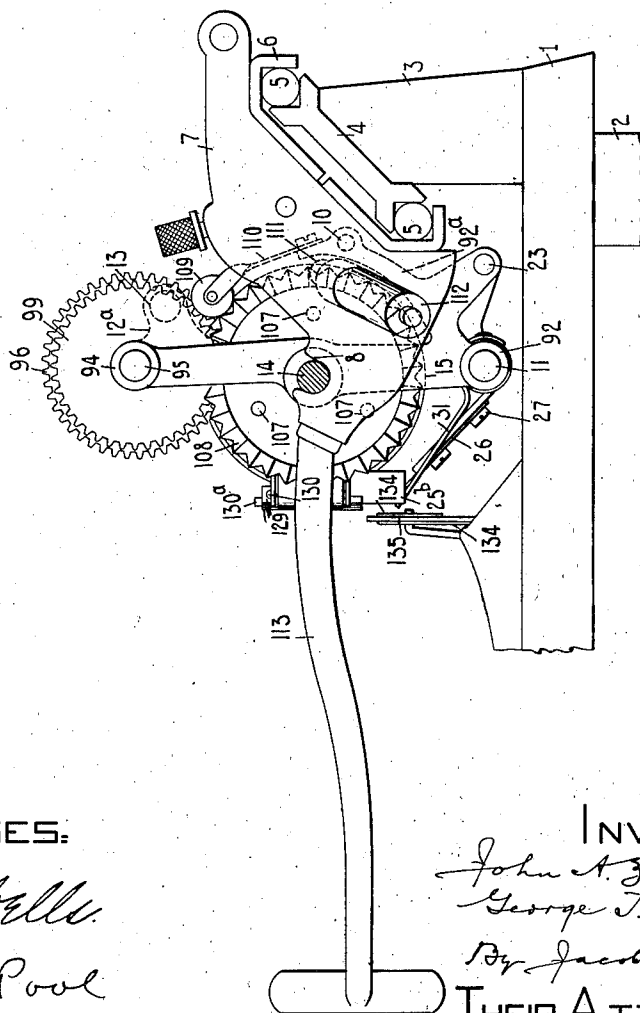


FIG. 1.



E. M. Wells.
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TYPE WRITING MACHINE.
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1,016,724.

Patented Feb. 6, 1912.

3 SHEETS—SHEET 2.

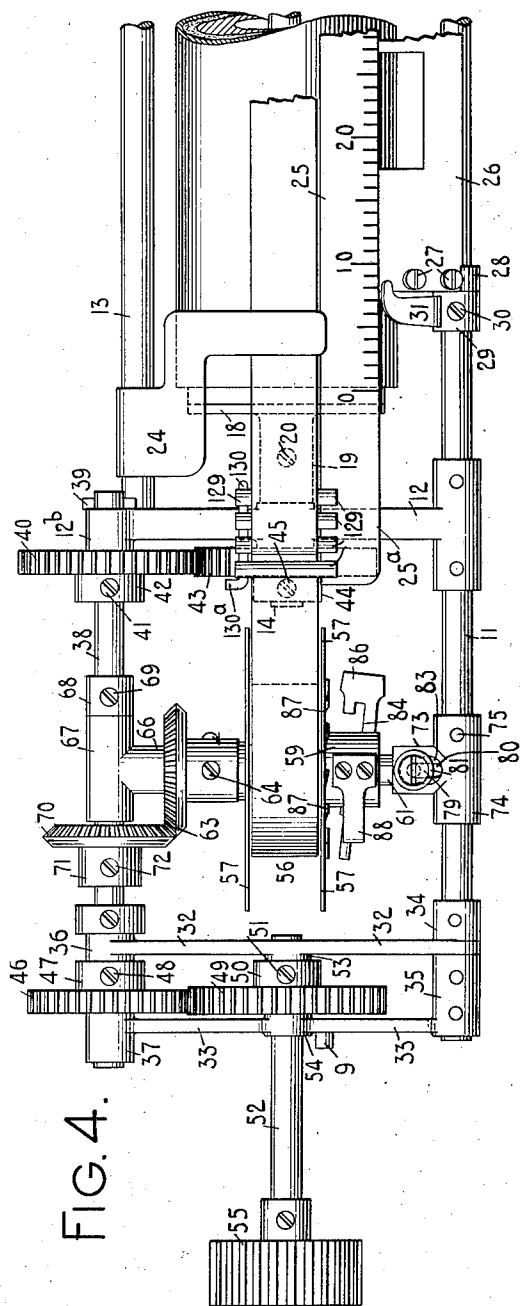


FIG. 4.

WITNESSES:

E. M. Wells
m.w. Pool

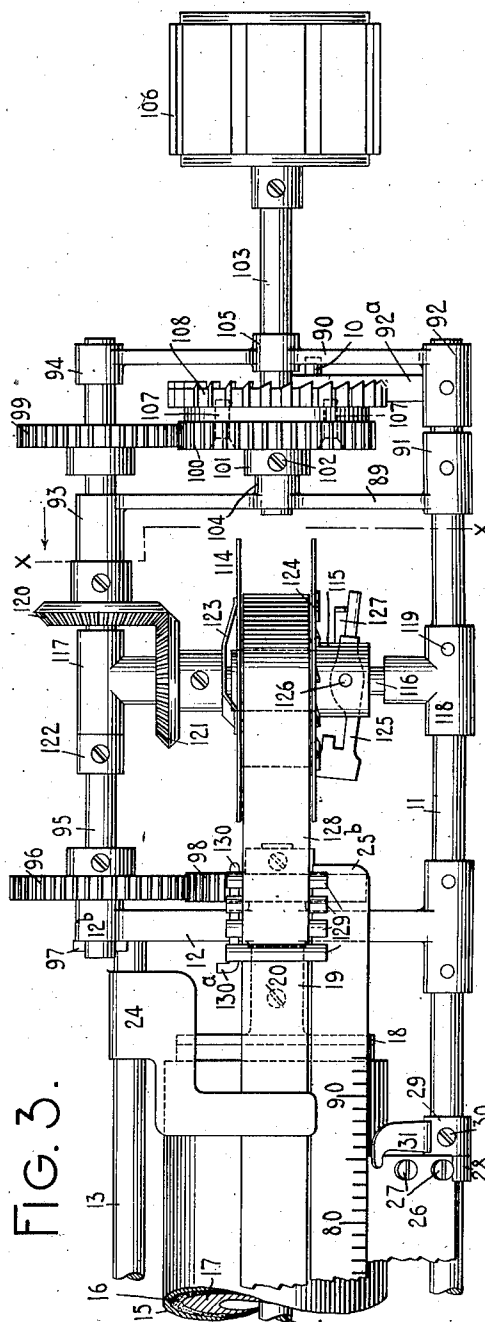


FIG. 3.

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3 SHEETS—SHEET 3.

FIG. 5.

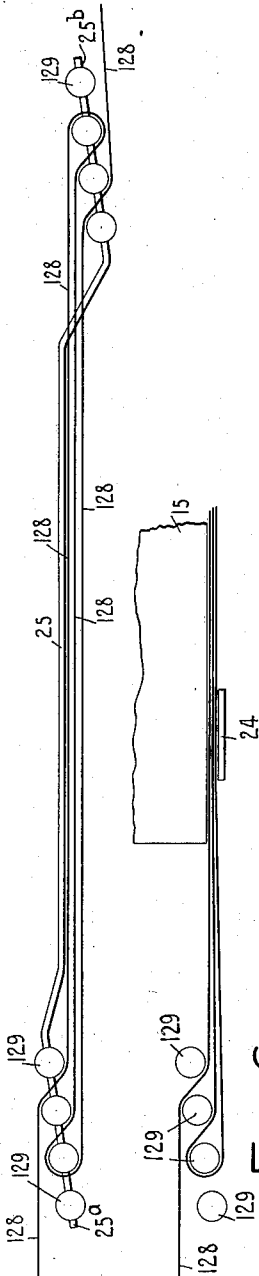


FIG. 6.

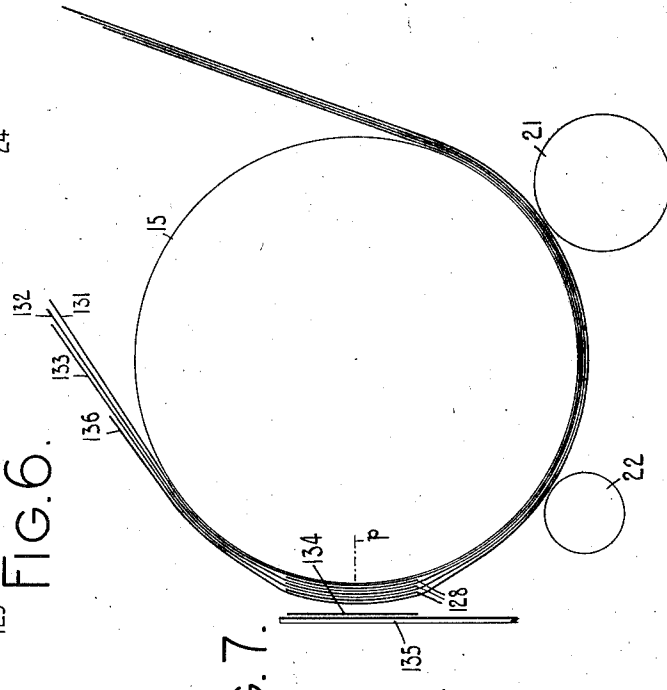
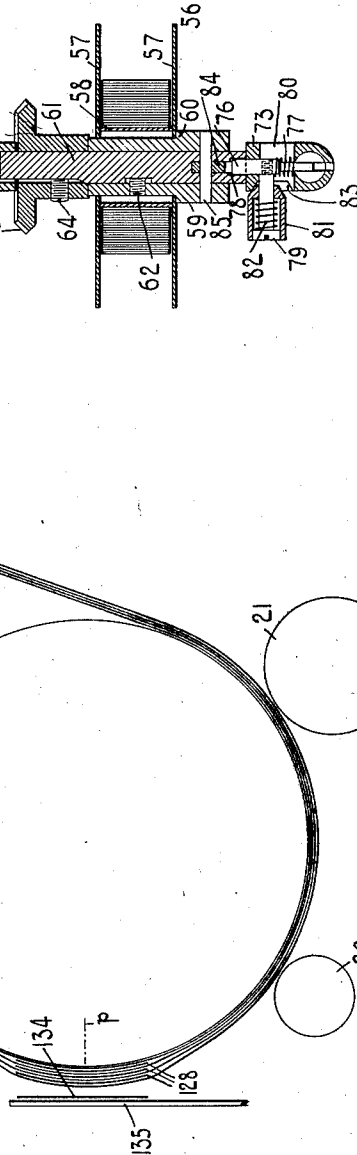


FIG. 7.



WITNESSES:

E. M. Wells
m. w. Pool

INVENTORS:

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George T. Price
 By *Isaac Feld*
 THEIR ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN A. ZELLERS, OF NEW YORK, N. Y., AND GEORGE T. PRICE, OF WEST ORANGE, NEW JERSEY, ASSIGNORS TO THE SMITH PREMIER TYPEWRITER COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

1,016,724.

Specification of Letters Patent.

Patented Feb. 6, 1912.

Application filed January 20, 1911. Serial No. 603,669.

To all whom it may concern:

Be it known that we, JOHN A. ZELLERS and GEORGE T. PRICE, citizens of the United States, and residents, respectively, of the borough of Manhattan, city, county, and State of New York, and of West Orange, 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.

Our invention relates primarily to inking mechanism for typewriting machines and its general object is to provide improved mechanism of the character specified.

More particularly our invention is concerned with mechanism for duplicating inked copies of typewritten work and especially with that class of mechanism in which a ribbon supplementary to the usual or main ribbon of the machine is supported and guided on the traveling carriage.

One of the objects sought and attained by the present invention is an improved and more effective carriage carried ribbon mechanism.

Another object is an improved mounting and arrangement whereby the mechanism is rendered compact and is disposed for the most part within the carrier frame as distinguished from mechanisms heretofore provided wherein the supplementary ribbon mounting has been outside of the carrier frame and has overhung or projected considerably beyond said frame.

Another object is to provide improved means for guiding the supplementary ribbon whereby a plurality of folds or plies of a single ribbon mounted on one pair of spools, may be availed of for writing a plurality of duplicates of the first copy made by the main ribbon.

Another object is to improve and render more effective the parts of the typewriting machine which cooperate with the mechanism proper of the supplementary ribbon, such parts including the line spacing devices.

Other objects will subsequently appear.

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

One means of carrying the invention into

effect is illustrated in the accompanying 55 drawings wherein—

Figure 1 is a fragmentary side elevation partly in section of the upper part of a No. 10 Smith Premier typewriter to which the invention is shown as applied. Fig. 2 60 is a vertical sectional view taken on a plane represented by the dotted line $x-x$ in Fig. 3. Figs. 3 and 4 are respectively front elevations of the right-hand and left-hand end portions of the platen frame or carrier 65 shown detached and with the present invention in place thereon. Fig. 5 is a diagrammatic plan view showing the course of the ribbon as it passes back and forth longitudinally of the platen and in front of the 70 same. Fig. 6 is a diagrammatic plan view showing the course of the folds of the supplementary ribbon between the platen and one of the usual paper fingers. Fig. 7 is a diagrammatic view showing in side elevation 75 the relationship between the folds of the supplementary ribbon and the work sheets printed therefrom. Fig. 8 is a central vertical sectional view of the left-hand one of the supplementary ribbon spools, its 80 mounting and various associate parts.

Although our invention is shown as applied to a machine resembling the No. 10 Smith Premier typewriter it is to be understood that said invention may be adapted in 85 whole or in part to other styles of writing machines. For clearness of illustration the platen frame is shown in the drawings as substantially upright but if preferred the platen frame may, in practice, be mounted 90 on the truck so that it will pull forward slightly as in the case of the platen frame of the No. 10 Smith Premier machine.

As shown in Fig. 1 of the drawings, the main frame of the machine comprises a top 95 plate 1 which is mounted on frame parts or posts 2, one of which is shown. Uprights 3 on the top plate support a stationary trackway 4 which cooperates through anti-friction balls 5 to guide and support a slide bar 100 6 comprised in a carriage truck which further includes end bars 7. Said end bars are provided with seats 8 and in rear of the seats are formed with depressions which receive studs 9 and 10 on the platen frame or carrier. 105 In the present instance said platen frame comprises a rod or bar 11 which is arranged below the platen and extends be-

yond its ends, said rod providing a support for two vertically disposed end bars or arms 12 formed at their upper ends with rearwardly curved extensions 12^a, said extensions being connected by a rod or bar 13 which extends longitudinally of the platen and above the same (Figs. 1 to 4). The end bars 12 provide bearings for the end portions of the platen axle 14 in which is mounted a platen comprising three layers, an outer metal skin 15, an intermediate layer 16 of rubber or the like, and a core 17 preferably of wood. Secured to the ends of the platen are heads 18, the hubs 19 whereof are secured to the axle 14 by screws 20. The platen, it will be observed, is arranged within a rectangular frame comprising the longitudinal rods 11 and 13 and the end bars 12.

Paper feeding and controlling devices cooperate with the platen, said devices including feed rollers 21 and 22 (Fig. 7), said feed rollers being mounted in a frame (not shown) which is supported on the frame rod 11. The feed rollers are releasable by devices (not shown) supported on a rock shaft 23 which takes bearings in the end bars 12. The paper feeding devices further include paper fingers 24 which are conventionally shown but which preferably are of regular construction, said paper fingers being slidably mounted on the rod 13 and extending down over the front of the platen, and being adapted to be swung up away from the printing face of the platen. A platen scale 25 extends along the platen below the printing point and projects beyond the ends of the platen overlying the end bars 12 (Figs. 1 to 4). Said platen scale is secured to the upper end of a scale frame 26, the ends of which are fastened by screws 27 to arms 28 pivoted on the frame rod 11. Collars 29 fixed by screws 30 to the rod 11 outside the arms 28 prevent endwise movement of the scale and supporting frame. Leaf springs 31 are secured to the collars 29 and assist in maintaining the scale 25 in cooperation with the platen or the paper thereon.

The platen frame is provided with extensions beyond the end bars or arms 12, which extensions support various elements of our novel ribbon mechanism. The frame rod 11 extends, as has been stated, beyond the end bars 12. Secured to the outer left-hand end of the projecting portion of the rod are parallel vertically disposed arms 32 and 33, these arms being provided with hubs numbered respectively 34 and 35 which are pinned or otherwise suitably fixed to the rod 11 (Fig. 4). The upper end of the arm 32 is provided with a hub 36 while the upper end of the arm 33 is provided with a hub 37, these hubs being bored out to provide journals for a shaft 38 which also bears in a hub 12^b at the upper end of the left-hand arm 12. The shaft 38 is adapted to turn but is held from endwise movement toward the left by a pin 39 which is driven through the right-hand end of the shaft and projects beyond the periphery thereof so as to engage with the upper end of the arm 12. The rightward movement of said shaft is prevented by a gear wheel 40 which is fixed to the shaft 38 close to the left-hand face of the hub 12^b by means of a screw 41 which engages in a collar 42 integral with said gear wheel 40. The gear wheel 40 meshes constantly with a gear wheel 43 of equal diameter which is provided with a collar 44 secured by a screw 45 to the left-hand end portion of the shaft 14 which projects beyond the left-hand end bar 12. Between the arms 32 and 33 is arranged a gear wheel 46 having a collar 47 receiving a screw 48 which secures said gear wheel to the shaft 38. This gear wheel 46 is equal in diameter to the gear wheels 40 and 43 and meshes with a gear wheel 49 of larger diameter which is formed with a collar 50 receiving a screw 51, said screw securing the gear wheel 49 to the inner end of a stub-shaft 52 bearing in enlargements 53 and 54 on the arms 32 and 33, said enlargements cooperating with the gear wheel 49 and its collar to prevent endwise movement of the shaft 52. Said stud shaft has secured to its outer end a finger wheel 55. It will be understood that by turning the finger wheel rotary movement will be transmitted from the gear wheel 49 to the gear wheel 46, thus rotating the shaft 38, this rotary movement being transmitted by the gear wheel 40 to the gear wheel 43 and thence to the platen. The movement of the platen will be in the same direction in which the finger wheel 55 is turned but will be somewhat increased in extent corresponding with the difference in diameter of the gear 49 as compared with gears 46, 40 and 43.

Means are provided for transmitting movements of the shaft 38 to a supplementary ribbon spool 56 which is centrally arranged within the rectangular space provided between the rod 11 and shaft 38 and arms 12 and 32. The construction and mounting of the ribbon spool 56 are shown in Figs. 4 and 8. The spool 56 which is horizontally disposed comprises flanges 57 and a hub 58 and is adapted to rotate on a collar 59, being supported on a shoulder 60 formed on said collar. Said collar is mounted on a shaft 61 and is secured thereto by a set screw 62. Above the collar a beveled gear 63 is secured by a screw 64 to the shaft 61. The upper end of the shaft 61 engages in a depression 65 formed in the depending portion 66 of a sleeve 67 which is rotatably mounted on the shaft 38. A collar 68 secured by a screw 69 to said shaft

38 prevents rightward endwise movement of the sleeve 67 while movement of said sleeve in the opposite direction is limited by the gear wheel 63 which meshes with a beveled gear wheel 70 having a collar 71 secured by a screw 72 to the shaft 38. The beveled gear wheels 70 and 63 communicate the turning movements of the shaft 38 to the shaft 61. The lower end of this shaft 61 rests on an upward projection 73 which is part of a collar 74 pinned at 75 to the rod 11. The shaft 61 is held from displacement from its seat or support 73 by a spring plunger 76 which is supported in the collar 74 and is pressed by its spring 77 into a hole 78 formed in the lower end of the shaft 61. A screw pin 79 projects forward from the plunger 76 through an opening 80 in the part 73. Mounted on the pin 79 is a plunger or button 81 having a beveled inner face which is pressed by a spring 82 against a beveled depression 83 in the part 73, said depression being slightly contracted about the middle of its length. The spring 82 acts to hold the beveled inner end of the button 81 engaged with or seated in the upper end of the depression and thus holds up the pin 79, the contracted middle portion of the depression cooperating with the beveled end of the button 81 to prevent accidental lowering of the pin 79 and the plunger 76 on which said pin is mounted, but by pulling the finger button 81 outward the pin 79 is released. Then by pressing down on the button 81 the plunger 76 may be withdrawn from engagement with the shaft 61 and the shaft and the parts carried by it including the spool 56 may be removed from the machine, the sleeve 67 turning on the shaft 38 to permit ready removal of the shaft 61 and the parts carried thereby. The button or detent 81 may be held by its spring 82 in lower or inoperative position through the cooperation of its beveled end with the lower contracted portion of the beveled hole 83, 80.

The spool 56 is loosely mounted on the collar 59 and is adapted to be connected with said collar and with the shaft 61 by means of devices which comprise a lever 84 pivoted at 85 to the shaft and collar and projecting radially outside the same. One end of the lever 84 serves as a finger piece and the opposite end is provided with a pawl tooth 86 which is adapted to cooperate with projections or tongues 87 struck from the lower flange 57 of the left-hand ribbon spool. A spring detent 88 is secured to the collar 59 and cooperates with the finger portion of the lever 84 to maintain said lever in working or non-working position, the non-working position of the lever being shown in Fig. 4. By pressing down on the left-hand end of the lever 84, as it appears in Fig. 4, it may be swung past the end of

the detent 88, thus causing the pawl tooth 86 to swing upward into the path of the projections 87. Thereafter movements of the shaft 61 in the direction of the arrow in Fig. 4 will be transmitted through the pawl 86 to the spool 56.

Referring now to the opposite end of the platen frame and considering more especially Figs. 2 and 3, the right-hand extension of the frame rod 11 supports upwardly extending parallel arms 89 and 90, the collar portions 91 and 92 whereof are pinned to the rod 11. Arms 89 and 90 extend substantially vertically upward and have hubs or enlargements 93 and 94 which provide journals for a shaft 95, the inner or left-hand end of said shaft bearing in a hub 12^b on the arm 12. It may be said at this point that the stud 9 at the left of the platen frame projects from the outer arm 33 (Fig. 4) while the stud 10 at the right of said frame projects laterally from a curved arm 92^a integral with and extending rearward and upward from the hub 92.

As in the corresponding left-hand construction, the shaft 95 carries a gear wheel 96 which prevents leftward movement of said shaft, rightward movement of said shaft being prevented by a pin 97. The gear 96 meshes with a gear wheel 98 which is fixed to the right-hand end portion of the shaft 14. Between the arms 89 and 90 a similar gear wheel 99 is fixed to the shaft 95, said gear wheel meshing with a gear wheel 100 having a collar 101, said collar receiving a screw 102 which secures the gear wheel 100 to a stub-shaft 103 bearing in lugs or enlargements 104 and 105 on the arms 89 and 90. The outer end of the stub-shaft 103 carries a finger wheel 106 which preferably is of greater width and of larger diameter than the ordinary finger wheel. Fixed by screws 107 to the outer face of the gear wheel 100 is a line spacing ratchet wheel 108 of the usual or any suitable construction. As shown in Fig. 1, a roller detent 109 mounted on a spring arm 110 and secured to the arm 92^a cooperates with the peripheral teeth of the ratchet wheel 108, while the crown teeth of said ratchet wheel are adapted to be engaged by a spring pawl 111 mounted in a housing 112 which is controlled by a line space handle or lever arm 113. This line spacing mechanism is preferably of the ordinary Smith Premier construction and will not be further described herein. It will be understood that by operating the handle 113 or by turning the finger wheel 106, motion will be transmitted from the gear wheel 100 to the gear wheel 99, thence to the shaft 95 and from said shaft through the gear wheels 96 and 98 to the platen. The movement will be somewhat increased owing to the fact that the gear wheel 100, which corresponds to the gear 49, is of

slightly greater diameter than are gear wheels 99, 96 and 98, these last three gear wheels being of equal diameter, and corresponding with the gears 46, 70 and 63.

5 A substantially horizontal supplementary ribbon spool 114, similar in construction to the left-hand ribbon spool 56, is arranged centrally within the space provided between the arms 12 and 89 and the rod 11 and shaft 95. The mounting and construction of said ribbon spool correspond generally with that of the left-hand ribbon spool, although the spool 114 is not detachably supported like the other. The spool 114 is loosely mounted on a shouldered collar 115, said collar in turn being secured to an upright shaft 116 which bears at its upper end in a loose T-shaped sleeve 117 arranged on the shaft 95 and at its lower end in an inverted T-shaped collar 118 pinned at 119 to the frame rod 11. The shaft 116 is adapted to receive motion from the shaft 95 through beveled gear wheels 120 and 121, the gear 120 being fast on the shaft 95 and the gear 121 being fast on the shaft 116. The gear 121 coöperates with the gear 120 to prevent rightward movement of the sleeve 117, while a collar 122, secured to the shaft 95 at the left of said sleeve, prevents endwise movement thereof toward the left. The spool 114 is held down in contact with the shoulder on the collar 115 by a spring 123. The under flange of said spool has downward projections or tongues 124 which are adapted to coöperate with a pawl member 125 pivoted at 126 to the collar 115. The pawl member and tongues serve to connect the spool 114 with the shaft 116 so that motion of the shaft is transmitted to the spool. Like the tongues 87 the tongues 124 have each an inclined face and a vertical face, so that each of the coöperating pawls will only act when turning in one direction. A spring detent 127 coöperates with the pawl member to maintain it engaged or in operative position as shown in Fig. 3. By pressing upward on the righthand arm of said pawl member, as it appears in said Fig. 3, it may be forced past the detent and the pawl member thus rendered inoperative. The ribbon spools and attached parts are preferably like those employed in the No. 10 Smith Premier machine.

A supplementary ribbon 128 is wound on the ribbon spools 56 and 114 and passes from one spool to the other lengthwise of the platen so as to cover the printing point at the front side thereof, said printing point being designated by the dotted line *p* in Fig. 7, the machine being of the front strike class. It will be observed that the ribbon passes in a straight line without being laterally deflected from its course from one ribbon spool to the other, this being due to the fact that the ribbon spools are arranged

with their axes substantially vertical and at right angles to the horizontal platen axis and the axes of the spools and the platen axis being in substantially a single plane, the platen axis passing through the spools midway between their flanges. In other words, the two parallel substantially upright spool axes are intercepted by the horizontal platen axis. The ribbon is looped or doubled back and forth so as to provide a plurality of plies or printing surfaces (three in the present case) over sets of devices which in the present instance comprise vertical pins or posts 129, four in each set, said set of pins being secured at their lower ends to extensions 25^a and 25^b from the ends of the scale 25. These extensions are bent or inclined slightly from the plane of the scale so that the sets of pins 129, instead of being parallel with the course of the ribbon, are slightly inclined thereto. As shown in Fig. 5 the left-hand extension 25^a on the scale plate is inclined slightly forward while the right-hand extension 25^b has a double bend so that the part to which the guide pins are attached may incline toward the rear, the construction being such that the two sets of pins 129 are in parallelism and at a slight angle to the plane of the body of the scale 25. Each set of pins may be provided at its upper end with a closure in the form of a transverse pin or finger 130 which engages holes in the upper ends of the pins and may be detached and removed by pulling on a vertical portion or finger piece 130^a so as to permit the ready passing back and forth of the plies of ribbon over the pins. After the ribbon has been properly arranged the closure 130 may be inserted so as to close the slots formed between pins and prevent the accidental displacement of the ribbon plies.

The arrangement of the ribbon plies will be best understood by reference to Fig. 5. The ribbon is led off the right-hand spool and passes between the rearmost or innermost two of the left-hand set of pins 129, extending thence lengthwise of the platen above the scale 25 and close to the printing line on the platen, the latter being covered by the ply of ribbon which is next looped around the second from the rear of the right-hand set of pins 129. Thence the second ply of the ribbon 128 extends leftward over and parallel with the first ply and passes around the second from the front of the left-hand set of pins, thence extending back in a third ply parallel to the inner two and over the same, the third ply passing at the right between the first and second of the right-hand set of pins and thence to the right-hand ribbon spool. It will be observed that by reason of the diagonal arrangement of the sets of pins the plies of ribbon are slightly separated, thus facilitating the interleaving

of the work sheets, three of which are shown in the drawing in Fig. 7 and numbered respectively, 131, 132 and 133. These work sheets are preferably in roll or web form, the webs being mounted at the rear of the machine; but, if preferred, detached sheets may be employed. If it is desired to make use of the main or regular vibratory ribbon 134 of the machine (which ribbon is controlled by a vibratory ribbon carrier 135 of the usual or other suitable style), then an additional work sheet 136 may be employed. The sheet 136 should be arranged outside of the ribbon plies 128 and the other work sheets 131, 132 and 133, and in position to receive impressions from the main ribbon 134.

After the work sheets have been interleaved the plies of ribbon 128 and the work sheets 131, 132 and 133 may be pressed close together, so as to promote good clear type impressions, by means of the spring mounted paper fingers 24, which paper fingers are preferably thrown back in inoperative position during the interleaving operation. After this operation has been completed the paper fingers are swung down to operative position and will act near the ends of the platen against the ribbon plies so as to press the plies closely between the platen and the paper fingers as shown in Fig. 6. When work sheets in roll form are employed a severing device (not shown) of suitable construction should be provided for detaching the written portions of the sheets.

It will be understood that when the line spacing handle 113 is operated, the motion communicated thereto will be transmitted to the platen through the right-hand train of gears 100, 99, 96 and 98, and that with the pawl member 125 operative as shown in Fig. 3, motion will also be transmitted through the gears 120 and 121 to the spool 114, said spool turning slightly to move the three plies of ribbon longitudinally of the platen, the outer ply moving rightward, the middle ply moving leftward and the innermost ply moving rightward along the platen and lengthwise of the printing line. A corresponding amount of ribbon will be unwound from the left-hand spool 56. When, however, the left-hand spool is operatively connected with its shaft 61 and the right-hand spool is disconnected from its shaft 116, then an operation of the line spacing handle will be transmitted through the right-hand set of gears to the platen, thence to the gears 43 and 40 at the left of the platen, and thence through the gears 70 and 63 to the right-hand ribbon spool, which thereupon turns to wind the proportionate amount of ribbon thereon, an equal amount being unwound from the right-hand spool 114.

It will be observed that we provide a rib-

bon supplementary to the main ribbon of the machine, said ribbon being mounted in a novel and compact way on spools within the platen frame; that said spools are in line with the printing line; that said spools are associated with guiding devices by which a single ribbon may be looped back and forth to provide a plurality of printing plies or surfaces which may be moved longitudinally by turning the spools; that reversing devices are provided for the ribbon so that it may be moved at will in opposite directions; that the feeding movements of the ribbon are automatically accomplished through novel connections with the line spacing mechanism or the means for turning the platen; that the last named means comprises finger wheels or rotary turning devices which are co-axial with the platen; and that various parts of typewriting machines heretofore provided, as for example, the ribbon spools and the means for connecting the same with the shafts on which they are mounted, may be employed.

Various changes may be made without departing from the scope of our invention.

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

1. In a front-strike typewriting machine, the combination of a platen, a platen frame provided with ribbon spool supports, ribbon spools on said supports and carrying a single ribbon, devices on said platen frame for guiding a plurality of plies of the ribbon lengthwise of the platen and over the printing point thereon, and means operating automatically to feed said plies of ribbon over said devices.

2. In a typewriting machine, the combination of a platen, a platen frame comprising integral supports, ribbon spools on said supports, said ribbon spools carrying a single ribbon, means for guiding a plurality of plies of said ribbon in parallelism lengthwise of the platen and to and from the spools, and normally operative feeding mechanism for feeding said plies over said means.

3. In a typewriting machine, the combination of a platen, a platen frame, a pair of ribbon spools mounted on said platen frame and carrying a single ribbon, means mounted independently of said ribbon spools for guiding a plurality of ribbon plies in parallelism lengthwise of the platen so as to cover normally the printing line, and normally operative feeding mechanism for advancing said plies lengthwise over said means.

4. In a typewriting machine, the combination of a platen, a platen frame, a pair of ribbon spools mounted on said platen frame, means for automatically feeding the ribbon between said ribbon spools, means for reversing the direction of ribbon feed, and means for guiding and maintaining a plu-

rality of plies of said ribbon lengthwise of the platen and covering the printing line thereon.

5 5. In a typewriting machine, the combination of a platen, a platen frame, means for line spacing the platen, ribbon spools on said platen frame carrying a single ribbon, connections between said line spacing mechanism and said ribbon spools, reversing devices connected with said ribbon spools, and
10 means for guiding a plurality of plies of said ribbon lengthwise of the platen and over the printing line thereon.

15 6. In a typewriting machine, the combination of a platen, a platen frame, means for line spacing the platen, ribbon spools on said platen frame carrying a single ribbon, gear connections between said line spacing mechanism and said ribbon spools, reversing devices connected with said ribbon
20 spools, and means for guiding a plurality of plies of said ribbon lengthwise of the platen and for retaining said plies over the printing line thereon.

25 7. In a typewriting machine, the combination of a platen, a platen frame comprising end bars and a frame rod which extends beyond said end bars; supplementary frame devices supported on the extensions
30 of said rod; shafts supported by said supplementary frame devices; and ribbon spools connected with said shafts and carrying a ribbon extending lengthwise of the platen, the ribbon spools being contained
35 substantially within the platen frame.

8. In a typewriting machine, the combination of a platen, a platen frame comprising end bars and a frame rod which extends
40 beyond said end bars; supplementary frame devices supported on the extensions of said rod; shafts supported by said supplementary frame devices; ribbon spools connectible with said shafts and carrying a ribbon
45 extending lengthwise of the platen; line spacing devices and trains of gears connecting said line spacing devices with said ribbon spools for automatically turning said ribbon spools when said line spacing devices
50 are operated.

50 9. In a typewriting machine, the combination of a platen; a platen frame comprising end bars and a frame rod which extends beyond said end bars; supplementary frame devices supported on the extensions of said
55 rod; shafts supported by said supplementary frame devices; ribbon spools connectible with said shafts and carrying a ribbon extending lengthwise of the platen; reversing devices for alternately connecting said
60 ribbon spools with their shafts; and platen line spacing devices which operate automatically to turn said ribbon spools.

65 10. In a typewriting machine, the combination of a platen; a platen frame comprising end bars and a connecting frame

rod which extends beyond said end bars; supplementary frame devices supported on the extensions of said connecting rod; horizontal shafts supported by said supplementary frame devices; substantially vertical
70 shafts supported on said horizontal shafts and on said extensions; ribbon spools on said vertical shafts; connections between said vertical shafts and said horizontal shafts; and means for connecting and dis-
75 connecting said ribbon spools with said vertical shafts.

11. In a typewriting machine, the combination of a platen; a platen frame comprising end bars and a connecting rod which extends beyond said end bars; supplementary
80 frame devices supported on the extensions of said connecting rod; horizontal shafts supported by said supplementary frame devices; substantially upright shafts supported on said horizontal shafts and on said extensions; ribbon spools on said upright
85 shafts; connections between said upright shafts and said horizontal shafts; means for connecting operatively said ribbon spools with said upright shafts and for disconnecting said ribbon spools from said upright
90 shafts; and devices operative by hand for permitting ready detachment of one of said upright shafts and the ribbon spool carried thereby.

12. In a typewriting machine, the combination of a platen; a platen frame comprising end bars and a connecting rod which extends beyond said end bars; supplementary
100 frame devices supported on the extensions of said connecting rod; horizontal shafts supported by said supplementary frame devices; substantially upright shafts supported on said horizontal shafts and on said extensions; ribbon spools on said upright
105 shafts; connections between said upright shafts and said horizontal shafts; means for connecting operably said ribbon spools with said upright shafts and for disconnecting said ribbon spools from said upright shafts; and devices operative by hand for permitting ready detachment of one of said upright shafts and the ribbon spool carried
110 thereby, said devices comprising a vertical spring plunger engaging the lower end of the last named upright shaft, and a horizontal projection from said plunger provided with a beveled spring button cooperating with openings in the shaft support.

120 13. In a typewriting machine, the combination of a platen frame, a platen, a ribbon spool, a shaft carrying said ribbon spool, a rotary sleeve on said frame providing a support for one end of said shaft, and devices
125 detachably connecting the other end of said shaft with the platen frame, said devices comprising a spring plunger engaging the shaft, a spring pressed finger button movably connected with said plunger and en- 130

gaging devices on said frame for said button.

14. In a typewriting machine, the combination of a platen, a platen frame, and supplementary ribbon spools mounted on said platen frame and carrying a ribbon which extends lengthwise of the platen over the printing line thereon, the axes of the ribbon spools being at right angles to the platen axis and being in the same plane as the platen axis and said ribbon spools being contained substantially within the platen frame.

15. In a front strike typewriting machine, the combination of a platen, a platen frame, and horizontally disposed supplementary ribbon spools mounted on said platen frame and carrying a ribbon which extends lengthwise of and over the front face of the platen, the axes of the ribbon spools being at right angles to the platen axis and being in the same plane as the platen axis, the spools themselves being intercepted by the platen axis substantially midway between the spool flanges and said spools being contained substantially within the platen frame.

16. In a typewriting machine, the combination of a platen, and sets of ribbon guiding devices thereon arranged at angles to the tangential plane passing through the printing point on the platen, said sets of devices controlling a plurality of parallel ribbon surfaces.

17. In a typewriting machine, the combination of a platen, sets of ribbon guiding devices thereon arranged at angles to the tangential plane passing through the printing point on the platen, said sets of devices controlling a plurality of parallel ribbon surfaces, and means for compressing said ribbon surfaces.

18. In a typewriting machine, the combination of a platen, sets of ribbon guiding devices thereon arranged at angles to the tangential plane passing through the printing point on the platen, said sets of devices controlling a plurality of parallel ribbon surfaces, and paper fingers coöperative with the platen for compressing said ribbon surfaces.

19. In a typewriting machine, the combination of a platen, and sets of ribbon guiding devices, the sets being arranged in parallelism and at an angle to the tangential plane passing through the printing point on the platen so that the plies of ribbon passing between said sets of devices are held separated from each other thereby.

20. In a typewriting machine, the combination of a platen, a platen frame, a scale mounted on said platen frame, and ribbon guiding devices on said scale.

21. In a typewriting machine, the combination of a platen, a platen frame, a scale

mounted on said platen frame, and sets of ribbon guiding devices at opposite ends of said scale.

22. In a typewriting machine, the combination of a platen, a platen frame, a scale mounted on said platen frame, and sets of ribbon guiding devices arranged on angularly disposed extensions of said scale, each set of devices comprising a plurality of parallel pins.

23. In a front strike typewriting machine, the combination of a platen, a platen frame, a scale mounted on said platen frame, and sets of ribbon guiding devices arranged on angularly disposed extensions of said scale, each set of devices comprising a plurality of parallel upright pins spaced apart.

24. In a front strike typewriting machine, the combination of a platen, a platen frame, a scale mounted on said platen frame, sets of ribbon guiding devices arranged on angularly disposed extensions of said scale, each set of devices comprising a plurality of parallel upright pins spaced apart, and removable closures connecting said sets of pins at about their tops.

25. In a typewriting machine, the combination of a platen, a platen frame, a scale mounted on said platen frame, sets of ribbon guiding devices arranged on angularly disposed extensions of said scale, each set of devices comprising a plurality of upright pins spaced apart, and removable closures comprising angled pins engaging holes in said upright pins.

26. In a typewriting machine, the combination of a platen, a spring pressed platen scale arranged parallel with and at one side of the printing line on the platen, and sets of ribbon guiding devices supported by opposite ends of said scale, said sets of devices being arranged at angles to the plane of the scale.

27. In a front strike typewriting machine, the combination of a platen, a spring pressed platen scale arranged below the printing line on the platen and lengthwise thereof, and sets of ribbon guiding devices supported by opposite ends of said scale, said sets of devices being arranged at angles to the plane of the scale and comprising upright pins adapted to receive the plies of ribbon and to hold said plies separated.

28. In a typewriting machine, the combination of a platen, a spring pressed platen scale arranged at one side of the printing line on the platen and lengthwise thereof, sets of ribbon guiding devices supported by opposite ends of said scale, said sets of devices being arranged at angles to the plane of the scale and comprising parallel pins adapted to receive the plies of ribbon and to hold said plies separated, and paper fingers extending crosswise of said plies and adapted to coöperate with the platen to

compress said plies and the interleaved work sheets.

29. In a typewriting machine, the combination of a platen, a platen frame, hand devices at opposite ends of the platen and co-axial therewith for turning the same, trains of gears connecting said hand devices with the platen at its ends, ribbon spools on said platen frame, and connections between said ribbon spools and said trains of gears.

30. In a typewriting machine, the combination of a platen, a platen frame, platen turning devices at opposite ends of the platen, trains of gears connecting said devices with the platen at its ends, said de-

vices comprising finger wheels and also a line spacing handle, ribbon spools on said platen frame, and connections between said ribbon spools and said trains of gears, said ribbon spools being rotatable by said finger wheels and said line spacing handle.

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

JOHN A. ZELLERS.
GEORGE T. PRICE.

Witnesses:

E. M. WELLS,
CHARLES E. SMITH.