A. G. F. KUROWSKI.

TYPE WRITING MACHINE.

APPLICATION FILED DEC. 20, 1909.

1,069,149.

Patented Aug. 5, 1913.

5 SHEETS—SHEET 1.

Fig. 1

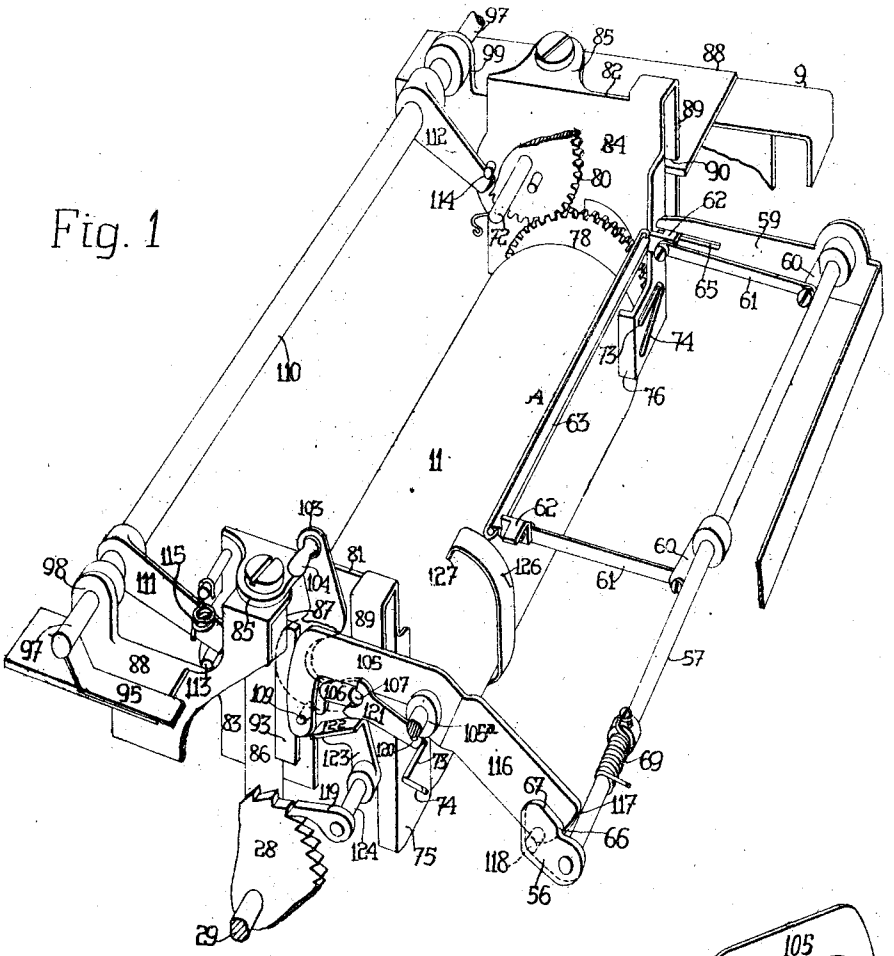


Fig. 14.

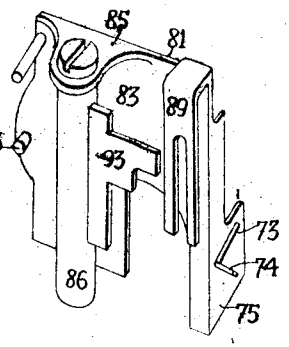


Fig. 15.

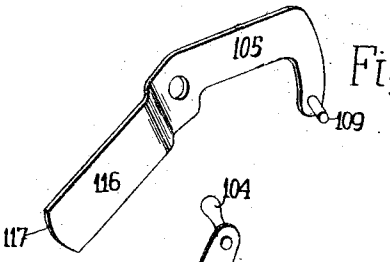
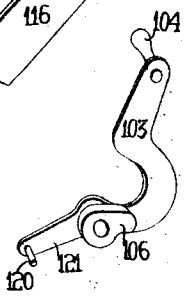


Fig. 16.



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5 SHEETS—SHEET 2.

Fig. 2

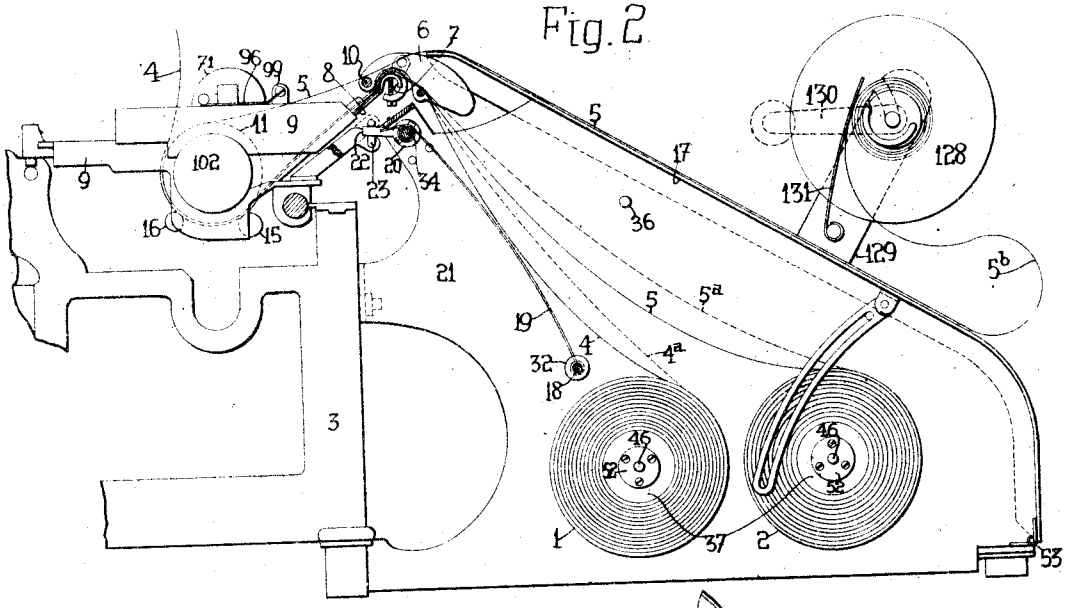
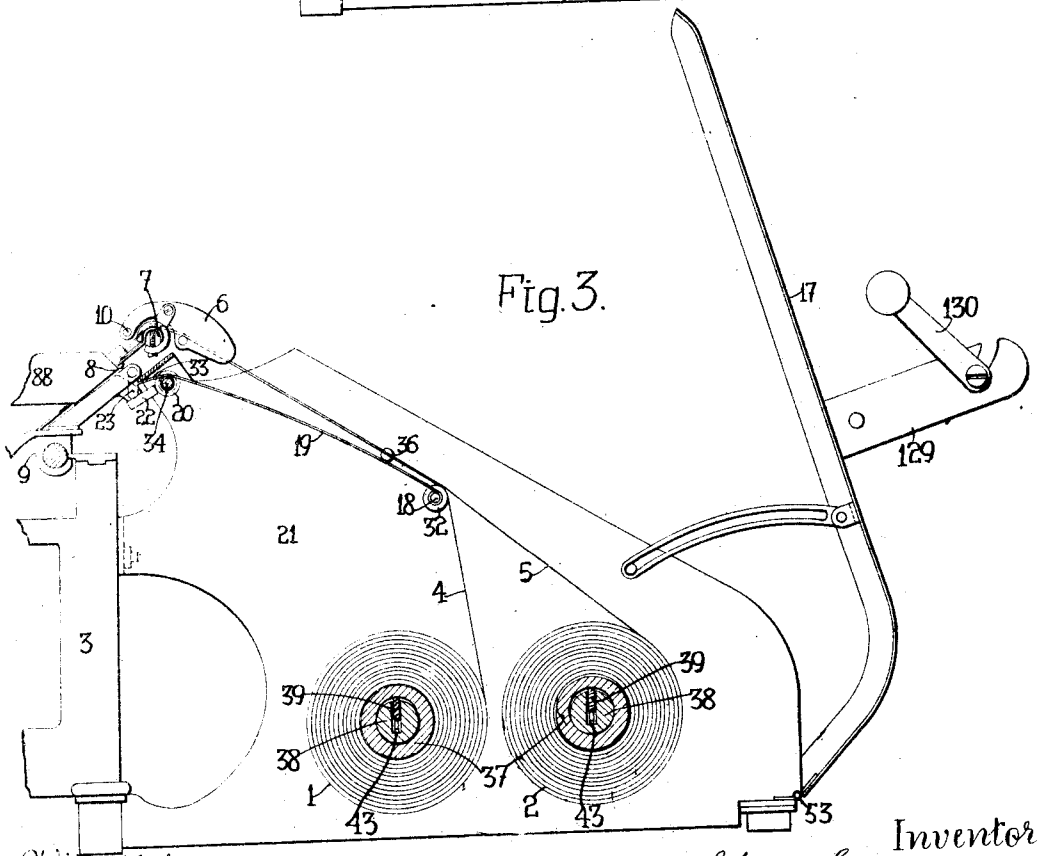


Fig. 3.



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5 SHEETS—SHEET 3.

Fig. 4.

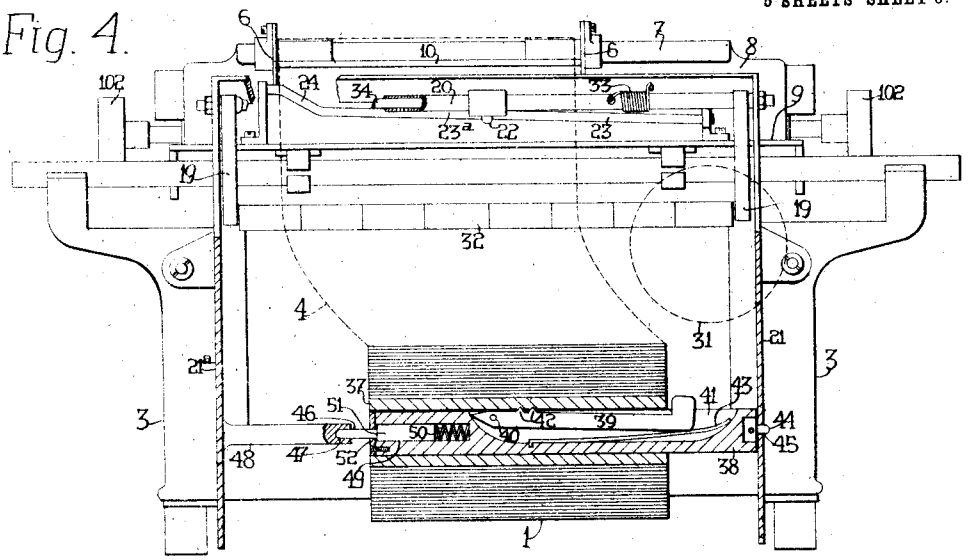
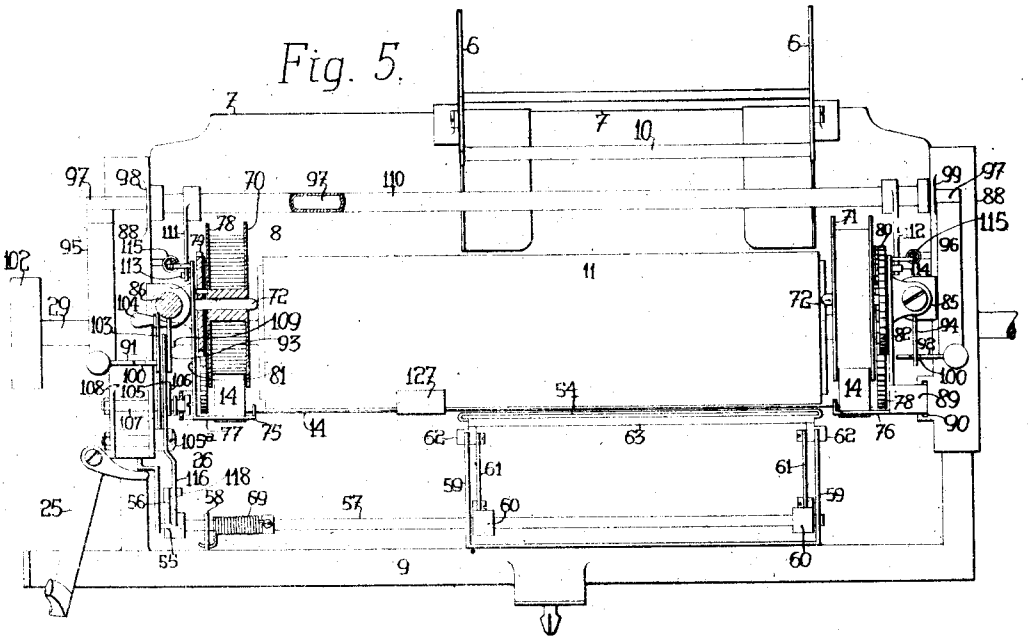


Fig. 5.



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5 SHEETS—SHEET 4.

Fig. 6.

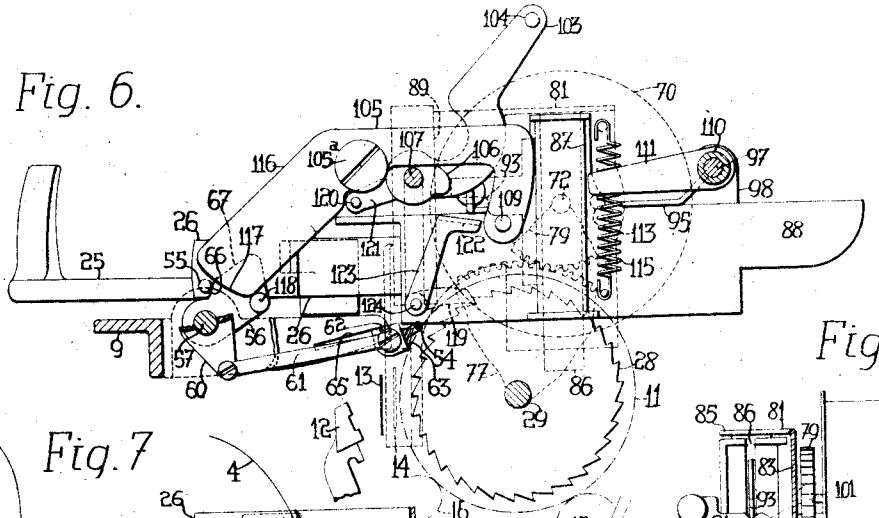


Fig. 8.

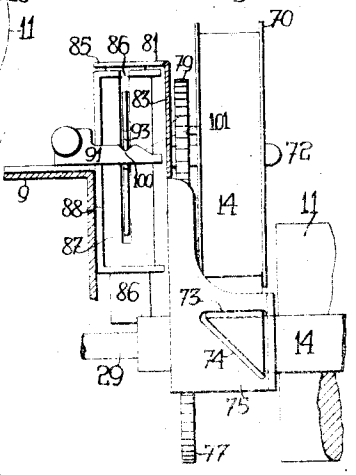


Fig. 7

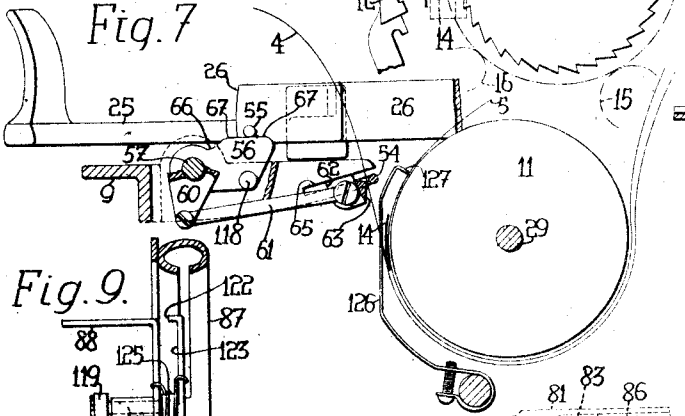
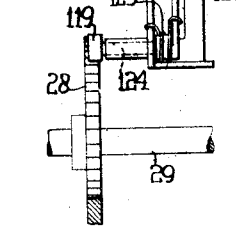


Fig. 9.



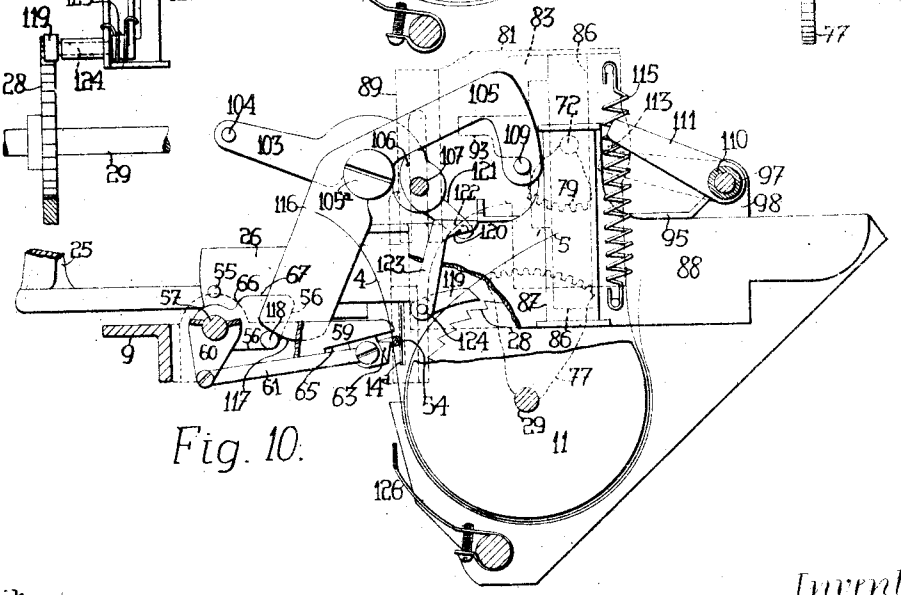


Fig. 10.

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5 SHEETS—SHEET 5.

Fig. 11.

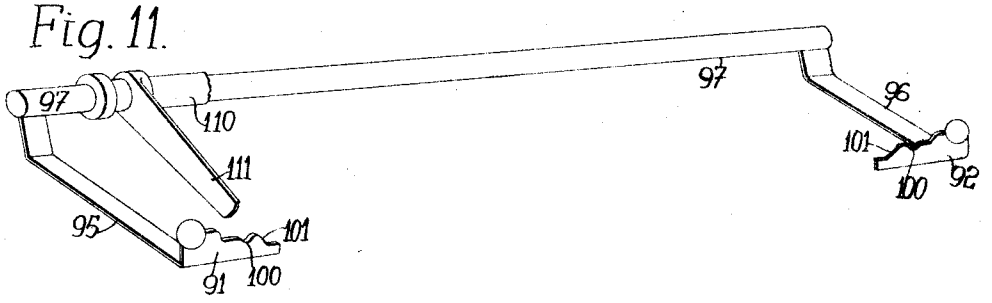


Fig. 12.

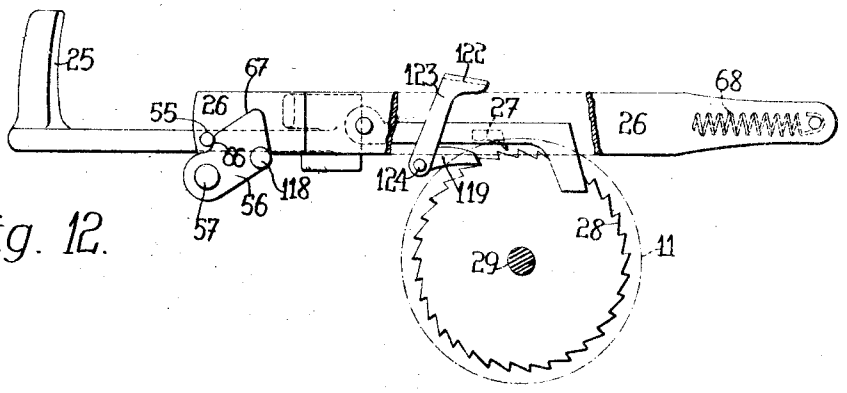
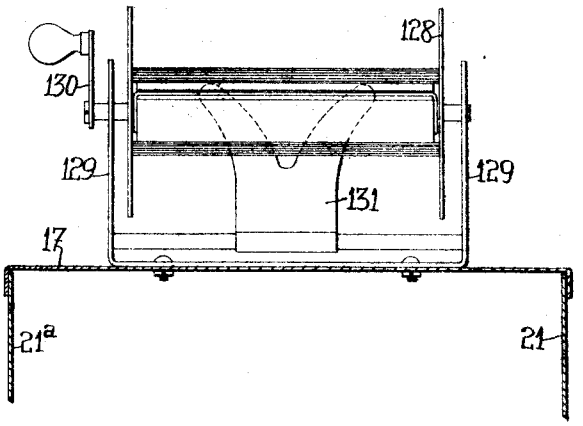


Fig. 13.



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UNITED STATES PATENT OFFICE.

ALFRED G. F. KUROWSKI, OF NEW YORK, N. Y., ASSIGNOR TO UNDERWOOD TYPE-WRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

1,069,149. Specification of Letters Patent. Patented Aug. 5, 1913.

Application filed December 20, 1909. Serial No. 534,070.

To all whom it may concern:

Be it known that I, ALFRED G. F. KUROWSKI, a citizen of the United States, residing in New York city, borough of Bronx, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to devices for feeding a web or plurality of webs from a roll or rolls around the revoluble platen of a typewriting machine, and also to machines in which in addition to the usual ribbon a second inking ribbon is interposed between the webs, so that the webs will be written in duplicate.

The webs are shown in the form of rolls which are rotatively mounted in rear of the typewriting machine, from which the webs are led forwardly beneath and around the platen. Since the weight of the rolls renders it objectionable to carry them upon the letter-feeding platen carriage, they are supported on a fixture and do not travel with the carriage. Since, however, the leading portion of the web, which is fed around the platen, does travel with the carriage, it results that that portion of the web between the carriage and the web spool is see-sawed back and forth during the movement of said carriage, and hence it is liable to strain and perhaps rupture at its edges. To overcome this liability, and to tend to prevent the web from shifting laterally from time to time while running around the platen, I have contrived a device which at every movement of the carriage in one direction loosens the outer coil or coils of web on the spool. This device is shown in the form of a lifter bar, which engages the reach of the web extending from the carriage to the spool and lifts the same, thereby turning the spool a little and paying off some of the web. The same bar serves to relieve both webs at the same time, or all the webs, if more than two are employed.

The employment of a second inking ribbon at the printing point to occupy a position between the webs has given rise to difficulties in some cases, owing to the fact that when the platen is turned there is a tendency for the two webs to coöperate to pick up the ribbon and carry it along in line-feeding direction, or in the opposite direction, if the platen is turned backwardly. To prevent such coöperation of the webs at inopportune times, I have connected to the line-spacing lever a device which separates the webs at a point close to the intervening ribbon, so that said webs cannot pick up the ribbon, and hence so that they may be advanced without dragging the ribbon with them.

To prevent dragging of the ribbon when the platen is rotated by means of the usual platen knobs at its ends, I provide a lever which is to be swung before such rotation of the platen is made. The swinging of this lever causes not only the withdrawal of the top web from the under web, but also moves the ribbon edgewise up to a position substantially clear of the rear web, so that the platen may be rotated forward repeatedly by means of said knobs, without liability of dragging up said intervening ribbon. To prevent downward dragging of said ribbon by the backward rotation of the platen, I provide a pawl to check the platen against backward rotation. This pawl is normally effective during the line-by-line operation of the machine, and can only be released by swinging said lever to effective position, and hence the platen may be turned backwardly only when the forward web is withdrawn from the ribbon, and the latter is elevated clear of the rear web. It will thus be seen that while the lever is in active position, the platen may be rotated freely either backwardly or forwardly to feed the webs in either direction, and this without liability of dragging of the ribbon in either direction. Said intervening ribbon is illustrated as mounted upon a pair of spools, which are mounted upon the carriage at the ends of the platen and connected by trains of gears to the platen axle, so that the ribbon is wound by the act of rotating the platen. Suitable provision is made for effecting reversal of the winding of the ribbon, this being accomplished by throwing one spool gear out of mesh with its platen gear and simultaneously throwing the other gear into mesh with its platen gear.

Other features and advantages will be hereinafter described, such for instance as an improved knife for use in tearing off the outer web.

In the accompanying drawings, Figure 1

is a perspective view of several of the main features of the invention, especially those located on or near the platen of the typewriting machine. Fig. 2 is a part sectional side elevation of the typewriter carriage and of the web rolls and the casing in which the latter are mounted. Fig. 3 is a view corresponding to Fig. 2, illustrating the operation of the lifting bar in loosening up the outer coils of the webs. This figure also shows the casing opened to permit inspection of or give access to the webs. Fig. 4 is a sectional rear view taken through one of the rolls of paper, and showing the rear portion of the typewriter and carriage, etc. Fig. 5 is a part sectional plan of the typewriter portion of the apparatus. Fig. 6 is a sectional view taken at the left hand portion of the platen carriage, and illustrating the parts in normal positions. Fig. 7 is a view corresponding to Fig. 6, but illustrating the manner of separating the webs to prevent them from picking up the intervening ribbon. Fig. 8 is a part sectional front elevation of a part of the ribbon mechanism. Fig. 9 is principally a detail of the pawl which engages the platen ratchet wheel to serve as a back check. Fig. 10 is a view similar to Fig. 6, but showing the lever having been swung to withdraw the forward web and lift the ribbon clear of the rear web. Fig. 11 is a perspective detail view of the switching cam mechanism for effecting the reversal of the direction of movement of the extra ribbon 14. Fig. 12 is a detail side elevation of the line-space mechanism, showing its relation to the lock for preventing the reverse rotation of the platen, and the web-separating mechanism, parts being broken away to better disclose the construction. Fig. 13 is a detail side view of the winding spool for the web. Fig. 14 is a detail perspective view of one of the movable frames and connected parts. Fig. 15 is a detail perspective view of the intermediate lever and arm for disengaging the ribbon from its driving mechanism and for operating the web-separating mechanism. Fig. 16 is a similar view of the operator's disengaging lever for throwing the parts to the position shown in Fig. 10.

Paper rolls 1 and 2 are mounted in rear of the typewriting machine 3, and the webs 4, 5 are led upwardly and forwardly therefrom between a pair of side guides 6 and over the rounded top 7 of the paper shelf 8 usually forming part of the paper carriage 9 of the Underwood typewriting machine, which is illustrated. The web is led down beneath a confining rod 10, and passes down around and up in front of the cylindrical platen 11.

Types 12 strike through ribbons 13 and 14 against the front side of the platen or the webs thereon. Pressure rolls 15, 16 of usual construction and connections cooperate with the platen to feed the webs.

The ribbon 14, it will be seen, extends along the front of the platen and occupies a position between the webs. The top web is intended to be cut off at short intervals. The bottom web may emerge from the machine, passing over the bar 10 and slipping downwardly along the top 17 of the casing, which is inclined backwardly and rearwardly to facilitate this movement of the web.

The paper rolls 1 and 2 are mounted to turn upon horizontal axes, which are parallel with the axis of rotation of the platen 11 and with the direction of travel of the carriage 9. Within the casing is a lifter bar 18 carried upon a swinging arm or frame 19 fixed to a rock shaft 20 journaled in the sides 21, 21ª of the casing. From the rock-shaft extends forwardly an operating-arm 22, which presses up against a bar 23 fixed upon the carriage 9 and having at its left hand end, Fig. 4, an inclined portion 24, up under which the operating arm 22 can ride to permit the lifter bar 18 to fall to the Fig. 2 position; said incline 24 thereafter serving at the return of the carriage as a cam to force down the arm 22 and swing the lifter bar 18 up toward the Fig. 3 position.

The webs are fed forwardly line by line by the usual lever 25, pivoted upon the carriage 9 and acting through a slide 26 and pawl 27 to rotate a line-space wheel 28, which is fixed upon the axle 29 of the platen 11. Said lever 25 is also a handle whereby the carriage 9 is run back to begin a new line; or in other words, the lever serves both to return the carriage and line-feed the paper.

It will be understood that the reach of web extending from the spool 1 or 2 up to the paper carriage is sometimes askew, as at Fig. 4 for instance, because of the movement of the paper carriage relatively to the stationary rolls. I contrive to effect the line-feeding of the web when this reach of the web is not skewed, or in other words when the web guides 6 on the carriage stand directly in front of the rolls 1, 2. This occurs after a line of writing has been completed and before returning the carriage to begin a new line. In order to cause the movement of the handle 25 to turn the platen and advance the web before the pressure on said handle starts the carriage back to begin a new line, the incline 24, Fig. 4, is made quite sharp or abrupt, so that the carriage encounters considerable resistance to its return movement, in addition to the resistance offered by the usual carriage-driving spring-barrel 31. The weight of the bar 18, which preferably serves as a shaft for a row of in-

dependently rotatable rolls 32, is sufficient to give a substantial check to the carriage, so that it is insured that the lever 25 shall rotate the platen 11 before the carriage 9 starts back. A spring 33 may be placed around the rock shaft 20 (which may be hollow and pivoted upon a tie-rod 34), to partially counterbalance the bar 18 with the rolls 32 thereon, so that too much resistance shall not be felt by the operator to the return movement of the carriage. The resistance at the sharp incline 24 is so great that the web not only advances before the carriage starts back but also before the bar 18 rises. Accordingly, the web first advances from the full line to the dotted line position, (4ª or 5ª) at Fig. 2, and then the bar 18 rises to the Fig. 3 position, to loosen the outer coils of the webs on the rolls 1 and 2. The rod 23 inclines as at 23ª from the lower portion of the cam 24 to the end of the rod, so that the bar 18 continues to swing upwardly but at a lower speed, during the entire movement of the carriage back to begin a new line. During the subsequent advance of the carriage in letter-feeding direction, the bar 18 falls first slowly and then rapidly, that the webs are quite slack when the time arrives for them to be again advanced in line-feeding direction.

It will be seen, in the rear view at Fig. 4, that the rolls 1, 2 are placed near the right hand side of the machine as viewed in that figure, so as to avoid skewing of the web when the carriage has completed the line of writing and it is time to advance the web. In order to avoid the necessity of setting the rolls too far to the right at Fig. 4, the web guides 6 on the carriage are set considerably to the right at Figs. 4 and 5. The extreme skewing of the reach of web between the spool and the carriage occurs when the latter has been returned to begin a new line.

Owing to the slackness of the web produced by the lifter bar 18, no harm is found to result in practice from such skewing, and at all events the skewing has no tendency to cause lateral disarrangement of that part of the web which is running over the guides on the carriage, since the advance movement of said web over said guides and around the platen occurs when there is substantially no skewing of the web, as above explained.

A stop 36 is provided to limit the throw of the lifter bar 18. Each web spool may have a hollow core 37 to slip upon a spindle 38, the latter having a lever 39 pivoted at 40 in a slot 41 extending along the spindle and provided with teeth 42 pressed outwardly by a spring 43 to engage the inner surface of the core 37 and lock the latter to the spindle. At one end, the spindle may carry a gudgeon 44 to fit in a bearing 45 in the adjacent side 21 of the casing; and the other end may be provided with another gudgeon 46 to fit in a bearing 47 provided in a stud 48 projecting inwardly from the opposite side 21ª of the casing. To provide for readily detaching the spool from the machine, the gudgeon 46 may be made of yielding construction and mounted in a socket 49 in the end of the spindle; a compression spring 50 being confined between the gudgeon body and the bottom of the socket, to hold the gudgeon out (a shoulder 51 upon the gudgeon being pressed by the spring against a cap 52 secured on the end of the spindle). To release the spool, it is only necessary to press it to the left at Fig. 4, sufficiently to withdraw the gudgeon 44, and then the spool may be withdrawn from the machine. For convenience of access to the spools, the top 17 of the casing may be hinged at its lower end at 53, to permit it to swing up, as at Fig. 3.

At a point just above the extra ribbon 14, a separator bar 54 catches behind the top or outer web 4, and is movable forwardly from the Fig. 6 position to the Fig. 7 position, for the purpose of separating the web 4 from the rear web 5, and prevent the ribbon 14 from being caught and carried along by said webs. This movement of the separator bar 54 occurs when the webs are advanced in line-feeding direction by the lever 25. Said slide 26 is provided with a wrist 55, Figs. 5, 6, 7 and 10, which engages an arm 56 fixed upon a rock-shaft 57 mounted in brackets 58, 59, secured to the front bar of the carriage 9; and upon said rock-shaft are fixed two pendent arms 60, connected by rearwardly extending links 61 to ears 62 provided upon the ends of a bar 63, said separator rod 54 being secured at its ends to the ends of said bar 63. The members 54 and 63, taken together, it will be seen at Fig. 5, form an elongated eye or slit through which the front web 4 is drawn, and by which its movements are controlled. The bar 63 serves as a knife edge, for convenience in tearing off the web 4 at intervals; said web being usually printed with a repetition of blank forms, and it being necessary to sever each form when it is written.

When the web is torn off, its upper edge extends no higher than the edge of the knife bar 63; and in order to prevent liability of a web edge becoming withdrawn from the combined control of said knife bar and said separator rod 54, I have contrived to make the separating movement of the rod 54 in a downward as well as forward direction; the ears 62 being for this purpose guided by downwardly and forwardly inclined slots 65 formed in the bracket arms 59. It is found that by making the withdrawing movement of the separator bar 54 in this direction, there is no liability of the

top edge of the severed web becoming released from the rod. It is further contrived that the web-separating movement of the rod 54 shall occur before the web is advanced in line-feed direction, to avoid the possibility of such advancing movement dragging the ribbon 14 up. To this end, the first portion of the rearward movement of the slide 26 is idle so far as the platen ratchet 28 is concerned, or in other words, the pawl 27 does not begin to act upon the platen until the lever 25 and the slide 26 have made the first portions of their respective movements. During the initial portion of the movement of slide 26, the wrist 55 thereon engages a cam portion 66 of the arm 56 and depresses said arm to the Fig. 7 position, completely withdrawing the web 4; and during the remainder of the rearward movement of the slide 26 and the consequent rotation of the platen, the wrist 55 travels idly along a dwell portion 67 of the arm 56, as at Fig. 7, thus holding the web 4 forward until the completion of the line-feed movement of the platen. The slide 26 is returned to normal position by a spring 68; and a spring 69 returns the rock-shaft 57 to normal position, together with the links 61 and the web-controlling members 63 and 54.

The ribbon 14 is wound upon a pair of spools 70, 71, arranged at the ends of the platen 11 with their axes parallel to the platen axis and turning loosely upon studs 72. The ribbon extends forwardly from the spool 70 and through horizontal and diagonal guiding slots 73 and 74 in a plate 75, and then along the front of the platen to corresponding guides in a plate 76, and thence back to the spool 71.

Upon the platen axle are fixed driving gears 77, 78 to mesh with pinions 79, 80 fixed respectively to the ribbon spools 70, 71. Either pinion may be lifted out of mesh with its gear while the other pinion is dropped into mesh with its gear, so that the ribbon may be caused to wind on either spool, as desired.

To facilitate such up and down movements of the winding pinions 79, 80, as well as for other purposes, the spool-carrying studs 72 are mounted respectively upon movable frames 81, 82, each frame comprising a main plate 83 or 84, having at its top a horizontal ear 85, from which depends a vertical guiding pin 86 fitting in a tubular housing 87 to slide up and down therein, said housings carried on brackets 88 secured upon the ends of the carriage 9. Each frame 81 or 82 also has a vertical guiding finger 89 to fit in a slot 90 cut in the bracket 88.

A device for reversing the direction of travel of the ribbon is seen at Figs. 5 and 8, comprising two cam plates 91, 92, to catch under arms 93, 94, projecting forwardly from the guiding pins or bars 86. These shifters or switches 91, 92 are intended to be moved simultaneously to the left or right, as the case may be, and for this purpose are fixed upon the forward ends of arms 95, 96, the latter rigidly connected at their rear ends by a rod 97, mounted in ears 98, 99, rising from the brackets 88. As seen at Fig. 8, each shifter or switch has a notch 100, in which the arm 93 (or 94) is caught, to hold the bracket 83 high enough to keep the pinion 79 thereon out of mesh with the gear 77, so that the spool 70 may pay off the ribbon, while it winds on the other spool. When the switch 91 is moved to the left at Fig. 8, the arm 93 is cammed out of said notch 100, and, upon further movement of said switch 91, arm 93 and bracket 83 are permitted to drop, to permit the pinion 79 to mesh again with the gear 77. At the same time through the connection 95, 97, 96, the arm 94 is cammed up by the inclined edge (101) on the switch 92, and said arm 94 drops into the notch 100 on said switch, so that the ribbon may pay off from the spool 71 and wind onto the spool 70. The plates 75, 76 are in the form of ears bent from the main plates 81, 82 of the spool frames.

Whenever desired, the webs may be advanced rapidly in line-space direction by means of the usual knobs or hand wheels 102 fixed upon the ends of the platen axle 29. In order to avoid liability of the ribbon 14 being dragged by the rapidly moving web or webs 4, 5 at such times, I provide a lever 103 having a finger-piece 104, whereby not only may the separator-rod 54 be drawn forwardly to the position at Fig. 7 or Fig. 10, but whereby the ribbon 14 may be bodily lifted from the position of confinement at Fig. 7 to the elevated position at 14^a, Fig. 10, where it is clear also of the rear web 5. For lifting the ribbon 14 to this position, said lever 103 is connected to the vertically movable ribbon frames 81 and 82, to lift up the frames bodily, together with the reach of ribbon which extends between the spools. This connection comprises an intervening lever 105, which is lifted by a cam 106 that is rigid with the lever 103, the latter being pivoted at 107 upon a small bracket 108 secured upon the left hand main bracket 88. Said cam 106 takes under the edge of the arm 105, the latter pivoted at 105^a upon said bracket 108, and having at its rear end a wrist 109, which takes under the arm 93 of the left hand ribbon frame 81, thereby lifting said frame to the dotted line position at Fig. 10.

The opposite ribbon frame 82 is connected to rise simultaneously, the connection including a rock-shaft 110, (which is hollow and fits upon the rod 97, as at Fig. 5) and arms 111 and 112 fixed upon said rock-shaft

and extending forwardly: the arm 111 being lifted by a wrist 113 on the left hand spool frame 81, and the other arm 112 engaging the pin 114 on the right hand spool frame 82 to lift the same. Upon relieving the lever 103 from pressure, the spool frames and other parts may be returned by springs 115.

It will be perceived that the lever 103 not only lifts the ribbon 14 up to the Fig. 10 position, but also draws forward the separator-rod 54; the lever 105 being, for this purpose, provided with an arm or extension 116 having at its lower end a cam 117, to engage a wrist 118 provided upon said rocking arm 56. During the rearward movement of the arm 116 from the Fig. 6 position to the Fig. 10 position, said cam 117 moves down the wrist 118, thereby swinging the arm 56 and the rock-shaft 57 to pull the separator-rod 54 forwardly, as at Fig. 10; so that the ribbon 14 stands clear of both the forward web 4 and the rear web 5.

Since there will be some liability, during the operation of the machine, of an attempt being made to turn the platen backwardly by means of the platen-knobs 102, I provide a back-check pawl 119, Fig. 1, which drops into engagement with the teeth of the ratchet wheel 28, and prevents any backward movement thereof, and hence of the platen 11. The lever 103, however, has means to release said pawl, so that when said lever is swung over to the position at Fig. 10, it will be possible to rotate the platen freely either forwardly or backwardly, as may be desired. This releasing means comprises a wrist or pin 120 projecting from an arm 121 of the lever 103, to engage a lip 122 provided on an arm 123, which is fixed to the short shaft 124, which carries said back-check pawl 119. At Fig. 10, it will be seen that said pin 120 engages lip 122, and lifts the pawl 119 from the ratchet. This movement preferably occurs during the final portion of the swinging of the lever 103, so that it is insured that the ribbon 14 shall be lifted clear of the bight of the webs before it becomes possible to turn the platen backwardly. A spring 125, Fig. 9, restores the pawl to effective position when the lever 103 is released.

A guiding finger 126, for the ribbon 14 may be placed to one side of the web but close thereto, to confine the ribbon as closely as practicable to the front of the platen, and at its top the finger may be hooked, as at 127, to prevent escape of the ribbon.

The reading end of the inner web 5 after sliding down the table 17 may be looped up, as at 5^b, Fig. 2, and caught upon a spool 128 detachably journaled in the arms of a bracket 129 and having a winch 130. By this means the web may be wound up from time to time for preservation. A brake 131 may be employed to bear upon the winding roll 128 to cause it to wind tight, and also to oppose unwinding thereof. The bracket 129 may be secured directly upon the cover 17.

When I refer in the claims to "sheet" I wish to be understood to mean also a group or layer or "take" of sheets such as are sometimes used together in typewriting machines.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a web delivering spool, a rotatable platen movable back and forth relative thereto tending to produce a tension to draw a web from said spool, and line-spacing mechanism therefor also tending to draw the web from the spool, of web-loosening mechanism for positively unwinding the web from the roll to produce slackness in the web during the major portion of the travel of the platen greater than that due to the drawing of the platen and line spacing mechanism.

2. In a typewriting machine, the combination with a web delivering spool, a platen movable back and forth relative thereto tending to produce a tension to draw a web from said spool, and line-spacing mechanism therefor also tending to draw the web from the spool, of web-loosening mechanism operated by the return of the platen to the beginning of a line for positively unwinding the web to produce slackness in the web between the spool and the platen greater than that due to the drawing of the platen and line spacing mechanism during the travel of the platen.

3. In a typewriting machine, the combination with a web delivering spool, a carriage moving back and forth relative thereto, a platen mounted in the carriage and tending to produce a tension to draw a web from said spool, and line-spacing mechanism for feeding the web around the platen also tending to draw the web from the spool, of web-loosening mechanism separate from the line-space mechanism and automatically operated to unwind the roll on the spool to produce a greater slackness in the web than that due to the drawing of the platen and line-spacing mechanism.

4. In a typewriting machine, the combination with a web delivering spool, a platen on a carriage movable back and forth relative thereto and tending to produce a tension to draw a web from the spool, and line-spacing mechanism therefor, also tending to draw the web from the spool, of web-loosening mechanism comprising a bar forcibly engaging the reach of the web between the spool and carriage to unwind the web from

the spool to produce a greater slackness in the web than that due to the pull of the platen and the line-spacing mechanism during the major portion of the travel of the platen.

5. In a typewriting machine, the combination with a web spool, a platen moving back and forth relative thereto, of a shiftable lifter bar; a rock shaft with which it is connected, an operating arm, and an inclined bar movable back and forth with the platen and engaging the arm to throw the lifter bar against the reach of the web between the roll and platen to relieve the strain on the web.

6. In a typewriting machine, the combination with a web delivering spool, a platen movable back and forth relative thereto and tending to produce a tension to draw a web from the spool, and line-space mechanism for feeding the web also tending to draw the web from the spool, of web-loosening mechanism separate from the line-space mechanism and operable to produce a greater slackness than that due to the pull of the platen and the line-spacing mechanism during the back and forth movement of the platen relative to the roll.

7. In a typewriting machine, the combination with a web delivering spool, a platen movable back and forth relative thereto, and line-space mechanism for feeding a web and for returning the platen to the beginning of a line, of web-loosening mechanism comprising a swinging bar, an operating arm for pressing the bar against the reach of the web, and a cam bar moving back and forth with the platen and engaging the arm to operate the swinging bar as the platen returns to the beginning of a line, the cam bar being effective to detain the platen at the end of the line of writing until the line-spacing mechanism has operated.

8. In a typewriting machine, the combination with a web delivering spool, a platen movable back and forth relative thereto, and line-space mechanism for feeding a web and for returning the platen to the beginning of a line, of web-loosening mechanism for relieving strain on the web occasioned by the relative movement of the platen to the spool and effective to retard the return of the platen to the beginning of a line until the line-spacing mechanism has operated.

9. In a typewriting machine, the combination with a web delivering spool, a platen movable back and forth relative thereto, and line-spacing mechanism for feeding a web and for returning the platen to the beginning of a line, of web-loosening mechanism comprising a lifter bar, an operating arm for pressing the bar against the reach of the web to loosen the outer coil of the roll on the spool, and a cam bar moving back and forth with the platen and engaging the operating arm to effect the operation of the loosening bar.

10. In a typewriting machine, the combination with a web delivering spool, a platen movable back and forth relative thereto, and line-space mechanism for feeding a web and for returning the platen to the beginning of a line, of web-loosening mechanism comprising a lifter bar, an operating arm for pressing the bar against the reach of the web to loosen the outer coil of the roll on the spool, and a cam bar moving back and forth with the platen and engaging the operating arm to effect the operation of the loosening bar; the cam bar having an abrupt incline to engage the operating arm when the platen is at the end of a line effective to retard the return of the platen to the beginning of a line until the line-space mechanism has advanced the web around the platen.

11. In a typewriting machine, the combination with a platen movable in letter-spacing direction, of a web delivering spool relative to which the platen moves, whereby as the platen is moved in one direction the reach of a web is skewed, line-spacing mechanism for feeding the web and for returning the platen to the beginning of a line, the web delivering spool being so located relative to the platen that when the latter is at one end of a line, the reach of the web will be in alinement with the spool and web, and retarding mechanism for temporarily detaining the platen at such end of the line until the line-space mechanism has operated to advance the web around the platen while in proper alinement with the platen.

12. In a typewriting machine, the combination with a platen movable in letter-spacing direction and return, of a web delivering spool relative to which the platen moves, so located relative to the platen that the reach of a web is in practical alinement with the platen when the latter is at one limit of its movement, line-space mechanism for feeding the web, and web loosening mechanism for relieving the strain on the reach of web and effective to retard the return of the platen to its opposite limit of movement until the web has been advanced while in substantial alinement with the platen.

13. In a typewriting machine the combination with a platen movable in letter-spacing direction and return, of a web delivering spool relative to which the platen moves, the spool being located near one limit of the range of movement of the platen so that the reach of the web will be in practical alinement with the platen when the latter is at such limit of its movement, and line-space mechanism for feeding the web while the reach of web is in substantial alinement with the platen.

14. In a typewriting machine, the combination with a platen movable back and forth, of a fixture relative to which the platen moves, a web delivering spool journaled in said fixture from which a reach of the web extends to the platen, a guide interposed between the spool and the platen to conduct a web toward the platen, a table on said fixture near the platen adapted to support a backwardly extending leading end of the web, and a winding spool for the leading end of the web arranged to the rear of the table.

15. In a typewriting machine, the combination with a platen carriage moving back and forth, of a fixed web delivering spool having its axis parallel with the platen, line spacing mechanism for advancing a web around the platen, and web loosening mechanism, said web loosening mechanism being operated by the carriage on its return movement.

16. In a typewriting machine for writing on a plurality of sheets, the combination with a platen, of a positively moving separating mechanism for moving the sheets apart, said mechanism being operated by the line spacing device.

17. In a typewriting machine for writing on a plurality of sheets in ink, the combination with a platen and a support arranged to hold a ribbon interposed between two sheets, at the printing line, of positively moving sheet separating mechanism for moving the sheets apart at a point close to the intervening ribbon to prevent dragging said ribbon above or below the printing line when the platen is rotated in one direction or the other to advance or feed back the sheets.

18. In a typewriting machine for writing on a plurality of sheets in ink, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-spacing mechanism, of sheet separating mechanism operated by the line-space mechanism prior to the advance of the sheets, to separate the sheets to prevent the displacement of the ribbon as the sheets are advanced.

19. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line space mechanism to advance the sheets, of sheet-separating mechanism comprising a bar passing behind the outermost sheet, and a rock-shaft to which the bar is connected and by which it is operated prior to the throw of the line-space mechanism to separate the sheets, and prevent the displacement of the ribbon during the subsequent advance of the sheets around the platen.

20. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-space mechanism to advance the sheets, of sheet-separating mechanism comprising a separating bar passing behind the outer sheet above the interposed ribbon and movable toward and from the platen to separate the outer sheet from that next beneath, to prevent the displacement of the ribbon as the sheets are advanced by the line-space mechanism.

21. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-space mechanism to advance the sheets, of sheet-separating mechanism comprising a separating bar passing behind the outer sheet above the interposed ribbon, a swinging arm connected with the bar to move the latter away from the platen to separate the outer sheet from that next beneath to prevent the displacement of the ribbon therebetween as the sheets are advanced by the line-space mechanism.

22. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-space mechanism to advance the sheets, of sheet-separating mechanism comprising a separating bar passing behind the outer sheet above the interposed ribbon and movable toward and from the platen to separate the outer sheet from that next beneath, to prevent the displacement of the ribbon as the sheets are advanced by the line-space mechanism; and a lever for actuating the sheet-separating and line-space mechanisms successively.

23. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-space mechanism to advance the sheets, of sheet-separating mechanism comprising a separating bar passing behind the outer sheet above the interposed ribbon, a cam-faced arm with which the separating bar is connected, and a lever-actuated wrist engaging the cam-faced arm to retract the separating bar from the platen against the tension of a returning spring.

24. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-space mechanism to advance the sheets around the platen, of separating mechanism effective to separate one of the sheets from the other to free the ribbon.

25. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged

to hold a ribbon interposed between two sheets, and line-space mechanism to advance the sheets around the platen, of separating mechanism effective to separate one of the sheets from the other to free the ribbon, including a separating member inserted behind the outer sheet, and movable toward and away from the front of the platen, and guides to direct the throw of the member.

26. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-space mechanism to advance the sheets around the platen, of separating mechanism effective to separate one of the sheets from the other to free the ribbon, including an eye through which the outer sheet is drawn, and a lever effective to control the position of the eye and sheet relative to the platen.

27. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-space mechanism to advance the sheets around the platen, of separating mechanism effective to separate one of the sheets from the other to free the ribbon, including a pair of members loosely embracing the outer sheet to control its position relative to the platen, and guides to determine the direction of throw of the web-controlling member.

28. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon interposed between two sheets, and line-spacing mechanism to advance the sheets around the platen, of separating mechanism effective to separate one of the sheets from the other to free the ribbon, including a separating bar taking behind the outer sheet and movable toward and from the front of the platen, a cutter lying in front of the outer sheet, a lever effective to draw the separating bar and cutter away from the platen, and guides to direct the throw of the separating bar and cutter downward and forward to prevent the disengagement of the severed end of the outer sheet and the separating mechanism.

29. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon to run between two sheets, and line-spacing mechanism, of a separating mechanism to engage the outer sheet to draw it away from the ribbon to the line-spacing of the sheets to prevent displacement of the ribbon, and effective to maintain the outer sheet withdrawn during the line-spacing operation.

30. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon to run between two sheets, and line-spacing mechanism, of a separating mechanism, comprising a bar to engage the outer sheet, a rock shaft with which the bar is connected to move toward and from the platen to withdraw the outer sheet from the ribbon prior to the line-spacing of the sheets, an arm for operating the rock shaft, and a lever for actuating the arm, and effective to maintain the bar and outer sheet withdrawn during the operation of the line-space mechanism.

31. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon to run between two sheets, and line-spacing mechanism, of a separating mechanism, an arm driving said separating mechanism from said line spacing mechanism, a dwell on the arm, and a driven member to engage the arm and dwell portion thereof to maintain the bar and outer sheet withdrawn during the operation of the line-space mechanism.

32. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a support arranged to hold a ribbon to run between two sheets, and line-spacing mechanism, of a separating mechanism comprising a bar, an arm driving said separating mechanism from said line-spacing mechanism, a lever to operate the line-space mechanism, said line-space mechanism being ineffective to advance the sheets during a portion of its stroke, and a projection connected with said line-space mechanism to engage the arm to operate the separating bar during the idle portion of the stroke of the line-space mechanism and effective to maintain the bar and outer sheet withdrawn during the line-space operation.

33. In a typewriting machine for writing on a plurality of superposed webs, the combination with a platen, a support arranged to hold a ribbon interposed between two webs, and a line-space mechanism, of a separating and cutting mechanism associated with the outer web to shift the latter away from the front of the platen to free the ribbon as the webs are advanced, and then return the web toward the platen, and effective to enable the operator to sever the outer web at will.

34. In a typewriting machine for writing on a plurality of superposed webs, the combination with a platen, and line-space mechanism for feeding the webs, of a separating and cutting mechanism associated with the outer web to shift the latter toward and from the platen, and effective to enable the operator to cut off parts of the outer web at will, and guides to direct the throw of the separating and cutting mechanism from the platen to prevent the disengagement of

the leading end of the severed web relative to the separating and cutting mechanism.

35. In a typewriting machine for writing on a plurality of superposed webs, the combination with a platen, a support arranged to hold a ribbon interposed between two webs and a line-space mechanism, of a separating and cutting mechanism having an eye through which the leading end of the outer web is drawn, one edge of the eye constituting a knife edge for severing portions of the outer web from the main body thereof, the separating and cutting mechanism being movable from and toward the platen, and guides to direct the eye down onto the leading end of the main body of the web, as the eye is drawn away from the platen to prevent the disengagement of the leading end of the web and the eye.

36. In a typewriting machine for writing on a plurality of superposed webs, the combination with a rotatable platen and a support arranged to hold a ribbon interposed between two webs at the printing line, of separating mechanism engaging the outermost web, to draw such outermost web away from the platen and ribbon prior to the rotation of the platen, and a lever effective to shift the ribbon support to carry the ribbon from close proximity to the sheets, and to simultaneously withdraw the outermost web relative to the platen and ribbon.

37. In a typewriting machine for writing on a plurality of superposed webs, the combination with a rotatable platen and a support arranged to hold a ribbon disposed between two webs, of a web-separating mechanism to engage the outermost web to withdraw it from the platen prior to the rotation thereof, and ribbon-displacing mechanism for shifting the ribbon support to displace the ribbon from and replace it between the webs.

38. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a movable support arranged to hold a ribbon interposed between two sheets, and a line-space mechanism, of separating mechanism for drawing the outer sheet away from the platen prior to the operation of the line-space mechanism, a check to prevent the backward rotation of the platen, and a controlling lever effective to operate the separating mechanism, displace the ribbon support to carry the ribbon from close proximity to the sheets, and subsequently release the check to permit backward rotation of the platen.

39. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a movable support arranged to hold a ribbon interposed between two sheets, and a line-space mechanism, of separating mechanism for drawing the outer sheet away from the platen prior to the operation of the line-space mechanism, a check to prevent the backward rotation of the platen, and a controlling lever effective to operate the separating mechanism and release the back check to permit backward rotation of the platen.

40. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, and connected frames arranged to support a ribbon interposed between two sheets, of a separating mechanism comprising a separating bar taking behind the outermost sheet to draw the sheet away from the platen to free the ribbon, a cam to operate the bar, a lever to lift the frames and elevate the ribbon from between the sheets, and a finger piece effective to operate the sheet-separating and ribbon elevating mechanisms.

41. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, and connected frames arranged to support a ribbon interposed between two work elements, of a separating mechanism, a pivoted check to prevent back rotation of the platen, a swinging arm connected with the check, and a lever effective to operate the separating mechanism to draw the outer element away from the platen, and to operate the swinging arm to release the check.

42. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, and connected frames arranged to support a ribbon interposed between two work elements, of a separating mechanism, a pivoted check to prevent back rotation of the platen, a swinging arm connected with the check, and a lever operating an arm to engage and through the swinging arm to release the check, the lever effective to operate the separating mechanism to draw the outer work element away from the platen.

43. In a typewriting machine for writing on a plurality of superposed sheets, the combination with a platen, a movable support arranged to hold a ribbon interposed between two sheets, and a line-space mechanism, of separating mechanism for drawing the outer sheet away from the platen prior to the operation of the line-space mechanism, a check to prevent the backward rotation of the platen, and a controlling lever effective to displace the ribbon support to carry the ribbon from close proximity to the sheets, and to subsequently release the back check to permit backward rotation of the platen.

44. In a typewriting machine for writing on a plurality of sheets, the combination with a platen, of a guide for a sheet, means driven by the line-spacing mechanism of the platen for moving said guide to swing said sheet away from the platen, said guide com-

prising a knife by which said sheet may be cut, and guides for said sheet guide to cause it to continually engage the sheet as it swings.

45. In a typewriting machine for writing on a plurality of sheets, the combination with a platen, of a line-spacing lever having the first portion of its throw idle with respect to line-spacing action, a guide for a sheet, arranged to move said sheet from the platen, and means for moving said guide by said lever during the idle portion of its throw.

46. In a typewriting machine for writing on a plurality of sheets, the combination with a platen, of a line-spacing mechanism comprising a lever, a slide moved by said lever and having a period of travel before it begins to operate the platen to space the line, a pin on said slide, a guide for one sheet, and a cam driven by said pin to move said guide to swing said sheet toward and from the platen, during the first period of travel.

47. In a typewriter, the combination with a traveling platen, of a stationary roll holder, a spindle adapted to carry a web in said holder, means for maintaining a slack reach in said web between said holder and said platen, a second stationary roll holder adapted to receive the web from said platen, and a support for a slack reach of web between said platen and said second roll holder.

48. The combination with a typewriter comprising a platen moving back and forth, of a stationary roll holder having an axis fixed parallel to the travel of said platen, means for feeding a web from said holder to said platen, and means for reducing in the web the effect of skew strain due to the movement of the platen.

49. The combination with a typewriter comprising a platen moving back and forth, of a stationary roll holder having an axis parallel to the travel of said platen, means for feeding a web from said holder to said platen, and means for making a reach of said web slack to diminish the effect of skew strains in the web during the traverse of the platen.

50. The combination with a typewriter having a traveling platen, of a roll holder, means for feeding a web from said holder to said platen, a second fixed roll holder, a support for said roller holder adapted to support a slack reach in said web, means for winding said web on said second holder, and a brake to cause said web to wind smoothly and to prevent said slack reach from dragging said web to unwind from said holder.

51. The combination with a typewriter of a carriage carrying a platen and movable back and forth, of a stationary roll holder having an axis parallel to the traverse of said platen, means actuated by said carriage for keeping loose a web passing from said holder to said platen, and a spindle for holding the web, said spindle being mounted near one end of the carriage traverse so as to reduce, in the web, the effect of skew strain.

52. In a typewriting machine, the combination with a traveling platen, of a stationary roll holder, a spindle adapted to carry a web in said holder, means whereby a slack reach is constantly maintained in said web between said holder and said platen, and an edge guide traveling with said platen to aline said web as it is fed on to said platen.

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