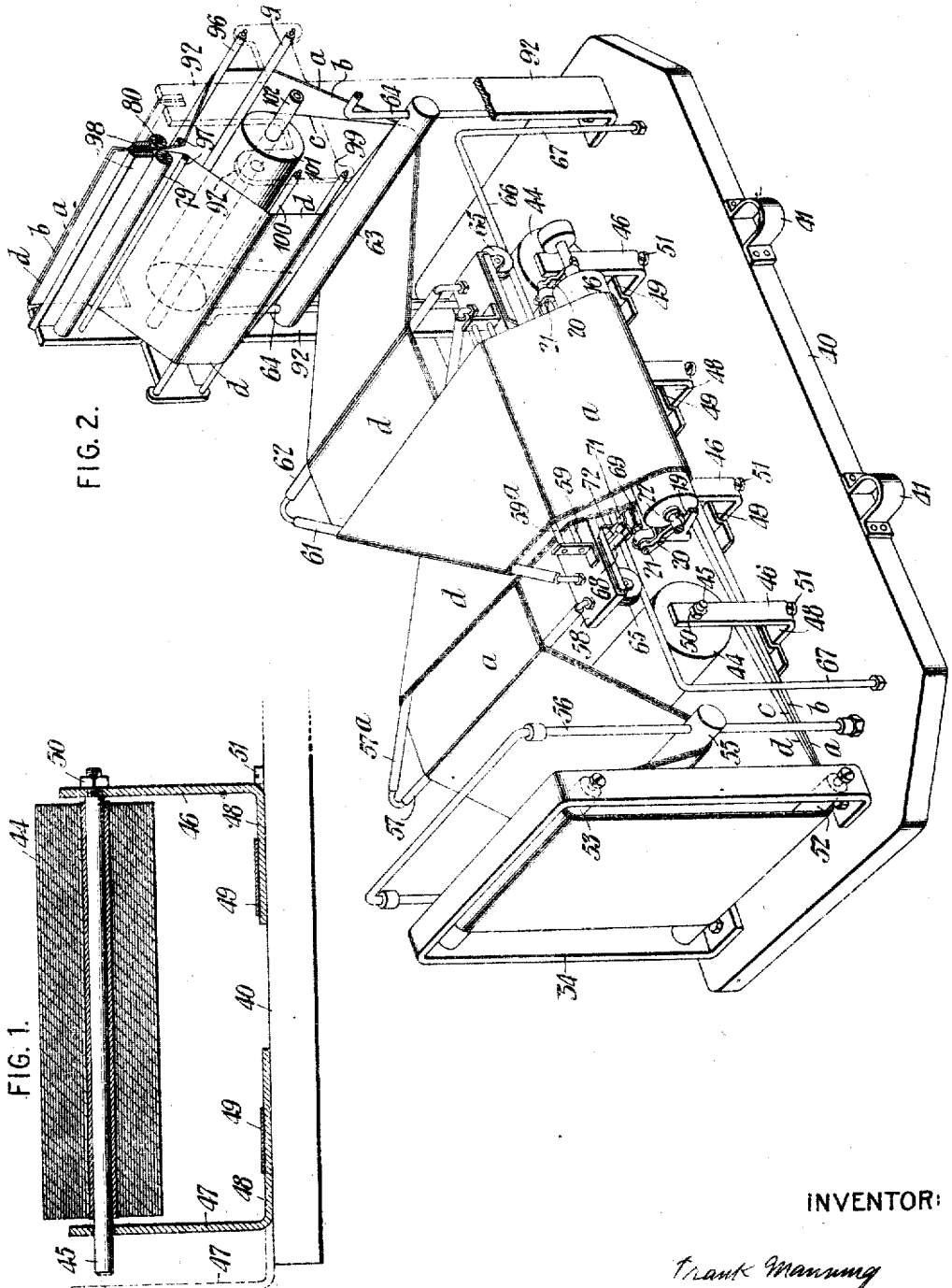


F. MANNING.
TYPE WRITING MACHINE.
APPLICATION FILED OCT. 7, 1916.

1,298,752.

Patented Apr. 1, 1919.
4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

FIG. 4.

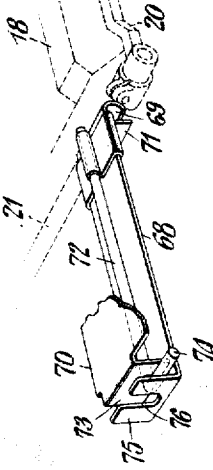
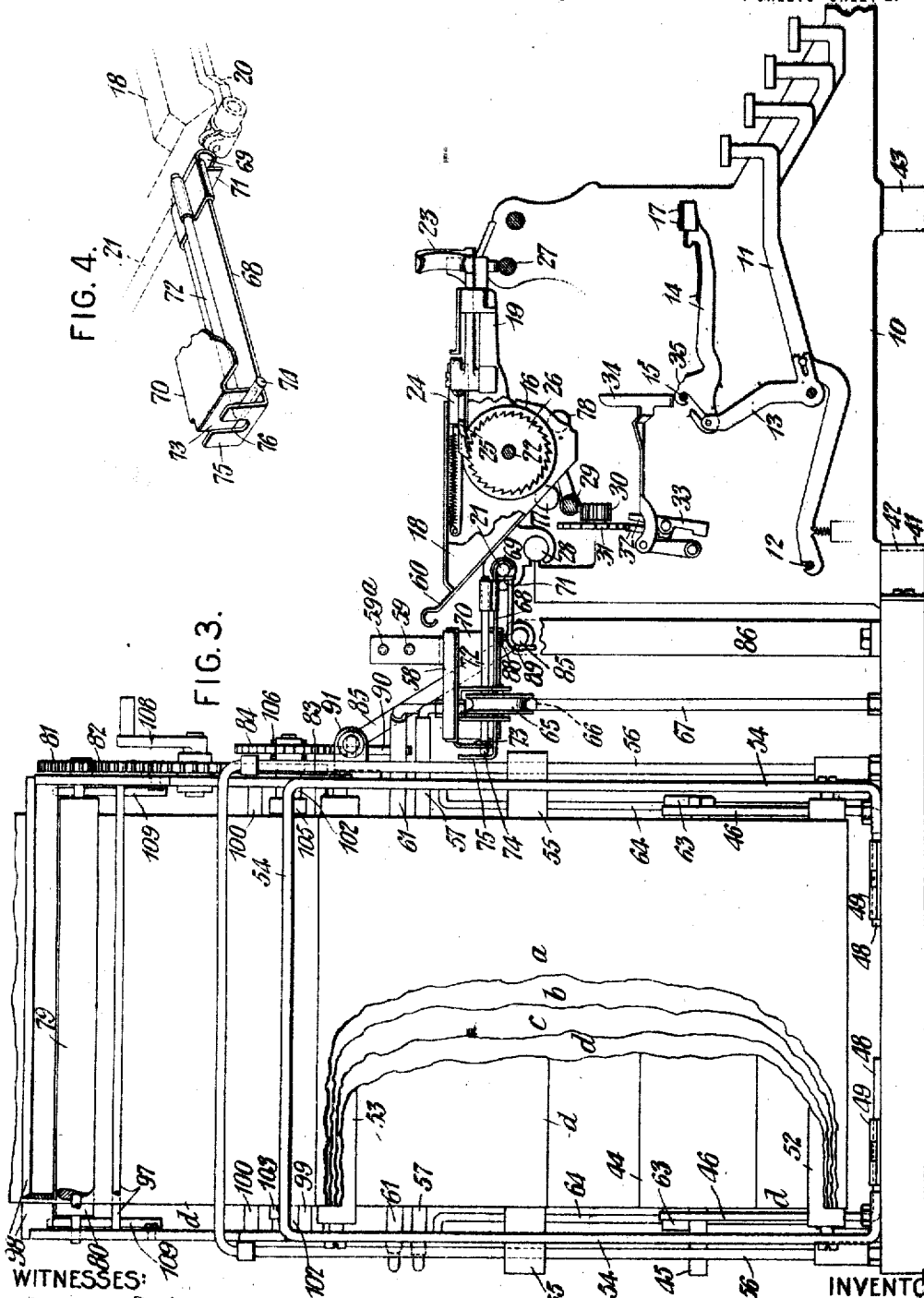


FIG. 3.



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4 SHEETS—SHEET 3.

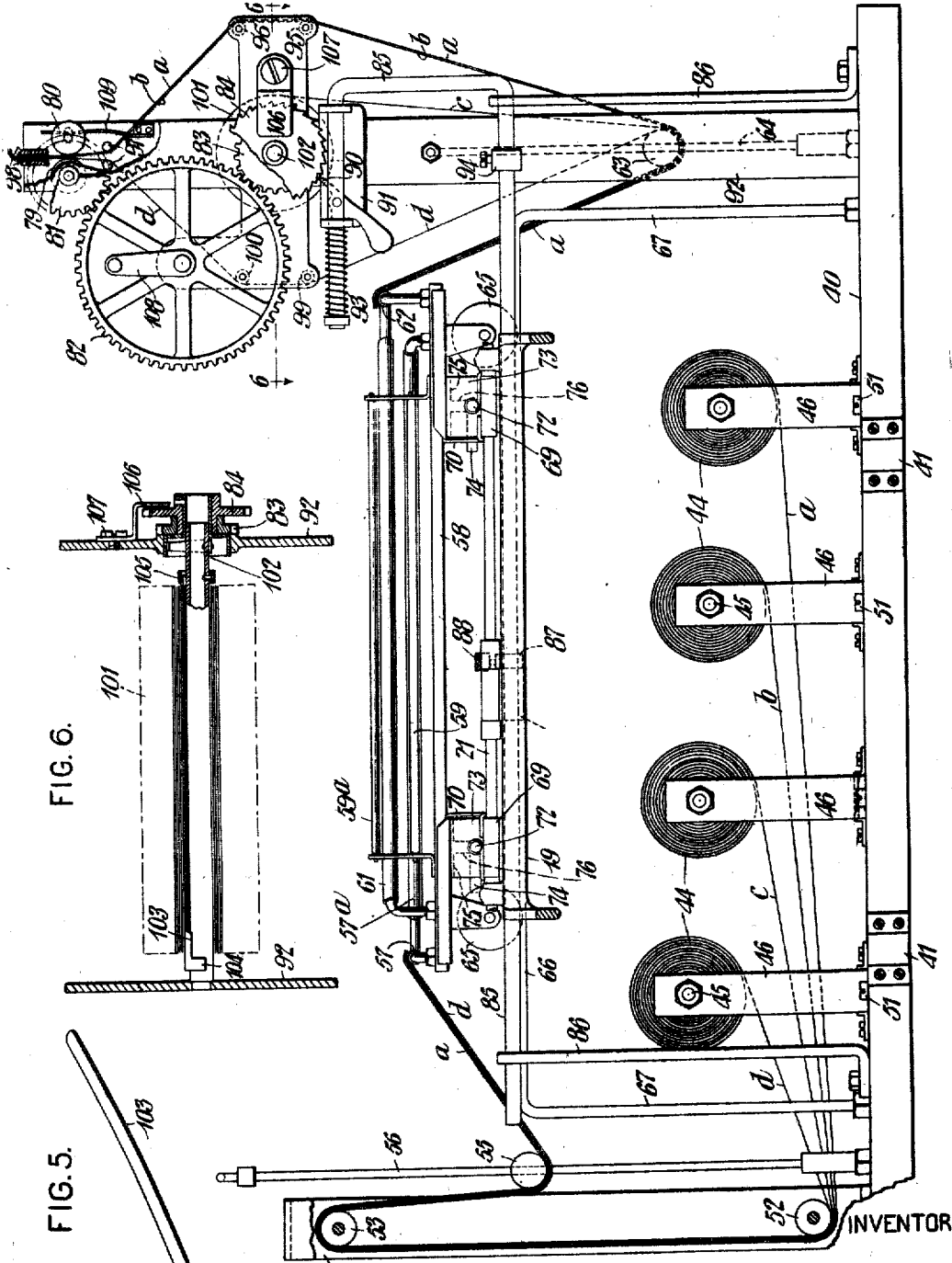


FIG. 6.

FIG. 5.

FIG. 7.

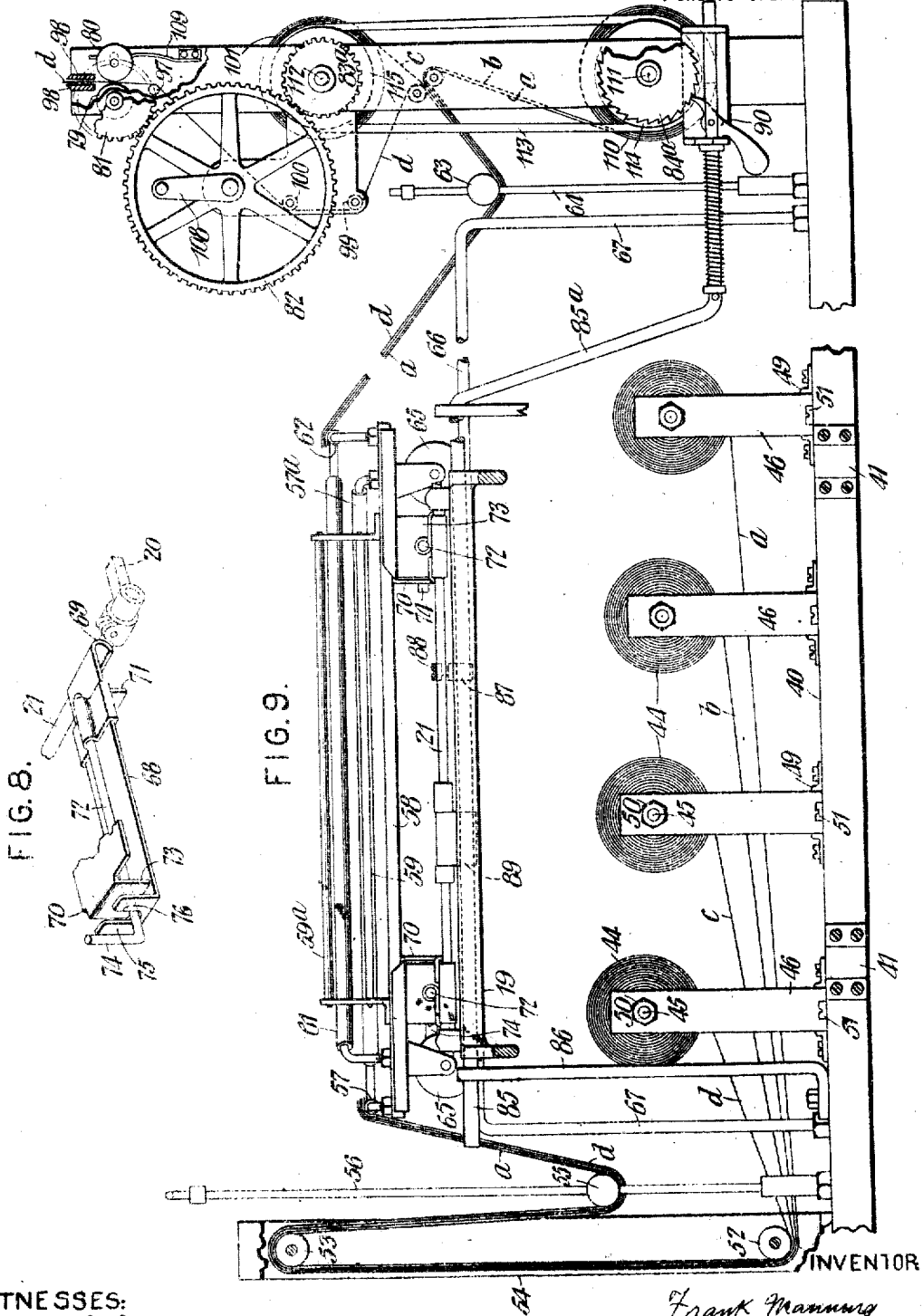
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1,298,752.

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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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TYPE-WRITING MACHINE.

1,298,752.

Specification of Letters Patent.

Patented Apr. 1, 1919.

Application filed October 7, 1916. Serial No. 124,213.

To all whom it may concern:

Be it known that I, FRANK MANNING, a citizen of the United States, residing in Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to means for enabling continuous sheets or webs to be fed over the platen of a typewriting machine to be written upon, and more particularly to improved means for supporting the webs separately from the typewriting machine, guiding the webs to and from the typewriter carriage and platen, and automatically feeding the portions of the webs that have passed beyond the carriage.

A feature of the invention is the provision of improved means for maintaining a continuous tension on the portions of the webs extending between the carriage and the stationary guides over which the webs extend in their passage toward and from the carriage.

A further feature of the invention relates to improved means which may be automatically actuated by the typewriter carriage, to feed the portions of the webs which have been written upon and which have passed beyond the carriage. Such feeding means may comprise a feeding couple for advancing one or more of the webs, and a storage roll or rolls, on which may be wound one or more record webs, and the carbon strips or webs which are interleaved with the other webs.

A feature of the invention relates to the arrangement of the supply rolls to extend in a direction at right angles to that of the platen, and the means to guide the webs in a course whereby the direction of the webs is changed so that they approach the platen in a direction normal thereto, means also being provided to again change the direction of the typewritten portions of the webs, so that they once more move in a direction at right angles to the platen.

The supply rolls may have a stationary mounting on a base removably attached to the frame of the typewriting machine, the webs being led over suitable guiding rolls from which they extend to a web supporting and guiding frame or carriage mounted to travel with the platen carriage. One or

more of the typewritten webs may be directed after leaving the platen to a pair of feed rolls, the latter actuated by suitable gearing driven by the carriage during its return movement, after completion of each typewritten line. A severing blade may be located beyond the feed rolls for detaching, from time to time, the typewritten portions of the webs. The carbon web or webs and also one or more record webs after being fed over the platen, may be wound on a winding roll or rolls, also driven from the carriage. Tension on the webs may be maintained by weights, one arranged to tension the portions of the webs extending between the supply rolls and the web-guiding carriage, and the other controlling the web portions extending from said carriage to the feeding means at the delivery side of the carriage. Said weights may be in the form of rods extending transversely of the webs and beneath which the webs are carried, so that the weight of the rods is sustained by the webs, the rods being mounted for free vertical movement on suitable guides.

Other features and advantages may hereinafter appear.

In the accompanying drawings,

Figure 1 is a sectional elevation of one of the supply rolls and its supports.

Fig. 2 is a front perspective view of the attachment comprising the web-supporting and guiding mechanism, and also showing a portion of the typewriter carriage.

Fig. 3 is a part-sectional elevation of the typewriting machine and the web-holding attachment, the view being from the left-hand end of the machine.

Fig. 4 is a fragmentary perspective view showing a connecting bar by which the auxiliary carriage or web-supporting and guiding frame is attached to the typewriter carriage.

Fig. 5 shows a spring-rod for fastening a web to its winding spindle.

Fig. 6 is a section on the line 6-6 of Fig. 7, showing the carbon-web-winding spindle and its driving gear.

Fig. 7 is a front elevation of the web-carrying attachment, and also showing the connection therewith of the typewriter carriage.

Fig. 8 is a view like Fig. 4, but with the clamping means in released position for disconnection from the carriage.

Fig. 9 is a view similar to Fig. 7, but showing a modified construction in which a winding spindle is employed to receive one or more of the typewritten webs.

The web-carrying attachment is shown as combined with an Underwood typewriting machine. The latter comprises a frame 10 on which are mounted key-levers 11 fulcrumed on a rod 12, said levers being connected through bell-cranks 13 with type-bars 14, fulcrumed at 15 to swing upwardly and rearwardly against the front face of the roller platen 16 when the keys are actuated, thereby causing the types 17 to print at the platen. The platen is mounted in a frame 18 which may be arranged to shift up and down on the carriage 19 for enabling either the upper or lower case types to print. As shown in Fig. 2, rock-arms 20 attached to a rock-shaft 21 extend forwardly and engage the platen axle 22, said shaft being rocked as the platen is shifted to different case positions.

Line-spacing mechanism for rotating the platen comprises a line-space lever 23 for moving rearwardly a slide-bar 24 on which is pivoted a dog 25, thereby causing the dog to drive a line-space ratchet wheel 26 fixed to the platen axle and thus rotate the platen. The carriage 19 is mounted to travel on front and rear guide rails 27 and 28, and may be driven in letter-feed direction by the usual spring drum (not shown). The letter-feed movements of the carriage are controlled by a carriage-rack 29 running in mesh with a pinion 30 connected to drive an escapement pinion 31 controlled by escapement dogs 32 on a dog rocker 33. The latter is actuated by a universal bar 34 in the path of shoulders 35 on the type-bars 14, so that at each type stroke, the universal bar is moved rearwardly and operates the escapement dogs to permit a step movement of the escapement wheel to letter-feed the carriage.

The attachment for supporting a number of rolls or continuous webs, and guiding said webs in their course toward and from the platen of the typewriting machine, may comprise a base 40 provided with sockets 41 to receive the rear feet 42 of the typewriting machine, the latter provided with front feet 43, by which the machine is supported on a level with said base 40. The several webs *a*, *b*, *c* and *d* may be supplied from rolls 44, carried on spindles 45 mounted in front and rear uprights or standards 46 and 47 which are preferably stepped to space the webs leading therefrom. The standards 46 and 47, as shown in Fig. 1, are in the form of angle-bars having horizontal extensions 48 to engage beneath straps 49 on the base 40. The spindle 45 (Fig. 1) is secured to the front standard 46 by a nut 50 removable to permit the roll 44 and its spindle to be removed or replaced by a new roll. The

standard 47 may be slid rearwardly to the dotted line position so that when the nut 50 has been removed, a roll and spindle may be placed in position or removed from the standards. Removable stops 51, in the form of screws, may be placed in front of the standards 46 to hold them against accidental displacement.

The webs from the rolls 44 may be led around a lower guide roll 52 and thence upwardly to and around an upper guide roll 53, said rolls 52 and 53 being journaled in an upright frame 54 bolted to the base 40 adjacent the left-hand end thereof. From the roll 53 the webs extend downwardly and around the lower side of a tension device 55, which may be in the form of a cylindrical rod or bar mounted to move freely up and down on vertical guide rods 56, the latter formed by a U-shaped frame mounted on the base 40. The bar 55 is supported on the webs and is operative by its weight to automatically maintain a continuous and substantially uniform tension on the portions of the webs leading to the typewriter platen.

From the tension device 55, the webs lead in an upwardly inclined direction to a horizontal guide rod 57 attached to and extending rearwardly from an auxiliary carriage or truck 58 connected to travel with the platen carriage 19 of the typewriting machine. The rod 57 forms part of a web supporting and guiding framework with which the truck 58 is provided, and by which the course of the webs is changed from a direction parallel with the carriage travel to a direction perpendicular thereto, so that the webs may be led to and around the platen, the direction of the web course being again changed by said framework to a direction parallel with the platen axis. The webs extend over the rearwardly projecting rod 57, which is perpendicular to the platen, and thence beneath and around a diagonal guiding rod 57^a, which may extend in the same horizontal plane with the rod 57, and by which the direction of the webs is changed so that they move forwardly to a horizontal guide-rod 59 on the truck 58, and downwardly therefrom over the paper-table 60 to and around the platen 16 and upwardly past the printing line.

From the delivery side of the platen, the web course extends upwardly and rearwardly to a rod 59^a parallel with the rod 59, thence rearwardly to and around a diagonal guide-rod 61 and over a rearwardly extending guide-rod 62, and thence to the right in a downwardly inclined direction to the tensioning device 63. The latter may be similar in construction and operation to the weight 55, and is mounted on vertical guide-rods 64. The guide rods 57 and 57^a may be formed, as shown, in a single piece comprising an angle rod lying in a horizontal plane

and rigidly attached to the truck 58. The guides 61 and 62 may also be formed of a single rod attached in like manner to the truck 58. The guides 59^a, 61 and 62 lie in a somewhat higher plane than the guides 59, 57, 57^a, to suitably space the web portions approaching the platen from those being carried beyond the platen.

The truck or web carrier 58 is provided with wheels 65 to run on a track 66 which may consist of a horizontal rail parallel with the typewriter carriage rails and having vertical ends 67 fixed to the base 40. The truck 58 is connected to the carriage 19 to travel therewith, by means of connecting bars 68, (Figs. 3, 4 and 8). Each bar 68 is formed at its forward end with a hook 69 to engage the rock-shaft 21 of the typewriter carriage, said bar 68 extending rearwardly beneath the truck 58 and attached to the latter by means of a bracket or connector 70 secured to and projecting downwardly from said truck. In order to retain the hook 69 on the shaft 21, a holding or locking plate 71 is provided, said plate being slidably mounted on the bar 68 to move forwardly and rearwardly to and from locking position. Said plate carries a rod 72 swiveled therein, and extending rearwardly therefrom through an opening in a vertical holding plate 73 attached to the truck 58. The rear end 74 of the rod 72 is bent to form a handle by which the rod may be swung from the Fig. 4 position, in which said end is locked between the plate 73 and an upturned end 75 of the bar 68, to a position in which said end 74 is in register with a slot 76 in the end 75 of the connecting bar. When in this latter position, the rod 72 may be pulled rearwardly to the Fig. 8 position to withdraw the locking plate 71 for releasing the bar 68 from the carriage. Preferably, a plurality of the connecting bars 68 are provided; as shown there is one adjacent each end of the carriage.

It will be seen that with the construction described, the web-carrying truck 58 is connected to travel with the platen, so that during the printing of a line the portions of the webs extending over the guide frames 57, 57^a, 61 and 62, and around the platen, maintain a constant position relative to the platen. As the carriage moves from right to left during the printing of a line, the bar 63 is lifted by the tension of the webs. At the same time the weight 55 moves downwardly, maintaining the tension of the webs between the guide roll 53 and the carriage as the latter moves toward said roll. The line-space lever 23 may be operated in the usual way to line-space the work and also return the carriage to position for writing a new line. That is to say, when the line-space lever is operated, the platen is rotated and cooperates with the platen feed rolls 77 and 78 to feed the webs forwardly over the printing line a line-space

distance. The weight 63 operates as the platen is thus rotated and as the carriage returns, to take up the slack which would otherwise be produced in the portions of the webs thus advanced. As the carriage moves to the right and the weight 63 moves downwardly, the weight 55 is pulled upwardly and the web course between the roll 53 and the traveling guide rod 59 approaches a straight line. In this position the weight 55 has much the same kind of effect on the webs that it would have on a toggle joint and so increases the tension on the webs sufficiently to cause the supply rolls to pay out a fresh supply of web at each return movement of the carriage. The amount of web thus paid out is regulated entirely automatically, because if the supply rolls at any time pay out more than is needed, the roll 55 is lowered so that the tension on the webs is reduced, and the supply rolls then remain at rest until the excess has been taken up by the platen. Any approved means may be provided to prevent the supply rolls from turning too freely, but ordinarily the frictional resistance is ample for this purpose without the provision of any special means.

The portions of the webs beyond the web-carrying frame are automatically fed forward or advanced by mechanism operated from the carriage at each return movement thereof. Such mechanism will now be described.

One or more of the webs are fed forward by a feeding couple consisting of feed rolls 79, 80. The roller 79 is positively driven by a gear train comprising a gear pinion 81 fixed to the feed roll 79 and running in mesh with a gear wheel 82 driven by a gear 83 driven by a ratchet wheel 84. The ratchet 84 has a step-by-step rotation imparted to it by means of an automatic driver or interponent 85 between the ratchet wheel and the platen carriage and driven by the latter at each return movement thereof. The driver 85 is in the form of a rod extending lengthwise of the platen, and which may be supported and guided in vertical standards 86 mounted on the base 40. A collar 87 on the rod 85, and which may be adjustable therealong and secured in adjusted position by a set screw 88, lies in the path of a lug 89 secured to the rod 21 or other part of the carriage.

As the carriage is moved to the right in returning it to position for commencing a new line, the lug 89 engages the collar 87 and moves the rod 85 to the right, thereby causing a dog 90, pivoted on said rod, to engage a tooth of the ratchet 84 and rotate it, and through the gear train 83, 82, 81, drive the feeding couple 79, 80. The parts are so proportioned that the feeding couple 79, 80, advances the webs therebetween a distance equal to a line-space, or, in other words, the

same extent that the webs are advanced over the platen by an operation of the line-space lever. The rod 85, as shown in Fig. 7, comprises an upwardly extending portion 5 terminating in a horizontal extension guided in a bracket 91, the latter carried by an upright frame or standard 92 on which said feeding couple and gear train are mounted. As the carriage moves to the left during the 10 writing of the line the interponent 85 is returned by a spring 93. The extent of the driving stroke of the interponent or driver 85 may be regulated by a stop 94 adjustable along the rod 85, which stop strikes the 15 standard 86 as said interponent completes its forward movement.

The webs *a*, *b*, *c* and *d* may comprise an outer web *a* to receive the original type impressions, a web *b* of transparent or translucent material, a carbon-web *c*, coated on 20 both surfaces with carbon or other transfer material, and an inner web *d*. That is to say, the superposed webs, where they extend over the platen at the printing line, comprise an outer web *a* which receives the type 25 impressions directly from the usual inking ribbon interposed between it and the types, while the underlying webs *b* and *d* receive their impressions from the intermediate carbon-web *c*, the impressions on the transparent web *b* being on the back surface thereof, but readable through the transparent material forming the web. It will be understood that the number of webs may be varied 30 as desired, and that carbon-webs coated on one side only, may alternate with the webs which receive the type impressions.

As shown in Figs. 2 and 7, the webs *a* and *b* extend upwardly from the tensioning rod 63 to guide rolls 95, 96, on the frame 92 and thence upwardly and inwardly between 40 guide rods 97 and between the feed rolls 79, 80.

A paper-severing device may comprise 45 blades 98 mounted in the framework 92 and spaced to provide a passageway for the webs, the upper edges of the blades being beveled to provide tearing edges. The web *d* extends upwardly and to the left from the rod 63 over guide rolls 99, 100, and thence upwardly and inwardly to extend between the 50 guides 97, feeding couples 79, 80 and tearing blades 98.

It will be noted that the course of the web 55 *d* beyond the tension roll 63, diverges from that of the webs *a*, *b*, to accommodate a winding roll 101, on which the carbon-web *c* between the webs *b* and *d*, is wound. The roll 101 is wound on a spindle 102 on which 60 the pinion 83 and ratchet 84 are mounted. The spindle 102 may be formed in sections, as shown in Fig. 6, to facilitate the assembling of the parts and to permit said spindle, with the carbon roll thereon, to be easily re-

moved. If desired, the carbon roll may be 65 used repeatedly. A spring holding rod or clip 103, Figs. 5 and 6, may be used to attach the end of the carbon strip to its spindle 102 in commencing the roll 101. Said rod 103 may comprise holding fingers 104, at one 70 end, to grasp the spindle, the opposite end of the rod being engaged beneath a collar 105 attached to the spindle. A keeper 106 attached to the frame 92 by a screw 107, projects over the ratchet 84 and holds the 75 latter, and also the roll spindle against end-wise displacement.

It will be seen that as the webs *a*, *b* and *d*, are fed by the couple 79, 80, the winding roll 101 takes up the carbon-web *c*. As the 80 diameter of the winding roll 101 increases it tends to wind the carbon strip more rapidly than the webs *a*, *b* and *d* are fed. A slip connection between the ratchet 84 and the winding spindle 102 is therefore provided to 85 permit the peripheral speed of the roll to accommodate itself to that of the webs *a*, *b* and *d*. A hand crank 108 may be connected to the gear 82 to permit the webs to be advanced independently of the carriage 90 travel. The pressure between the feed rolls 79, 80, may be maintained by springs 109 bearing against the shaft of the roll 80.

Fig. 9 illustrates a modification in which the webs *a* and *b* are wound in a roll 110. 95 The roll 110 is wound on a spindle 111, to which a ratchet 84^a is secured, said ratchet corresponding to the ratchet 84 of Fig. 7, and driven by the dog 90 on the driver 85^a. The function and operation of the driver 85^a 100 are the same as those of the driver 85 in Fig. 7. The carbon roll 101, in Fig. 9, is wound on a spindle 112 driven from the spindle 111 by means of an endless belt 113 running over pulleys 114 and 115, secured to the spindles 105 111 and 112, respectively. A gear pinion 83^a on the spindle 112 is connected through the gear wheels 82, 81, to drive the feeding couple 79, 80, which, in this instance feeds the single web *d*. 110

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

Having thus described my invention, I 115 claim:

1. In a typewriting machine, the combination with a carriage, of means providing a web course over which webs are guided to the carriage and comprising a stationary 120 guide for the webs, and means interposed between said guide and the carriage for maintaining a continuous tension on the webs as the carriage travels toward and from said guide.

2. In a typewriting machine, the combination with a carriage, of means providing 125 a web course over which webs are guided to the carriage and comprising a stationary

guide for the webs, and a tension and take-up device interposed between the carriage and said guide.

3. The combination with a roller platen, of a supply roll having its axis at right angles to that of the platen, means forming a web course over which a web from the roll is guided to the platen and including means by which the direction in which the web is fed, is changed from a direction in a plane parallel with the platen to a direction normal thereto, and a tension-bar parallel with said supply roll, beneath which the web is guided, said bar mounted to move freely up and down and operable by its weight to maintain a continuous tension on the web.

4. The combination with a paper carriage, of a stationary supply roll, the axis thereof being perpendicular to the line of travel of the carriage, means forming a web course over which a web is fed from said roll to the carriage, and a tension and take-up device interposed between said supply roll and carriage.

5. The combination with a paper carriage, of a stationary supply roll, the axis thereof being perpendicular to the line of travel of the carriage, means forming a web course over which a web is fed from said roll to the carriage, and a tension and take-up device interposed between said supply roll and carriage; said tension and take-up device comprising a bar beneath which the web is guided, the weight of the bar being supported by the web, said bar being free to move up and down as the carriage travels and thereby maintain a continuous tension on the web.

6. The combination with a carriage and a roller platen mounted thereon, of means for supplying a web to be fed over the platen, a stationary guide over which the web is advanced toward the carriage in a direction parallel with the direction of the carriage travel, means moving with the carriage for guiding the web and changing its direction so that it approaches the platen in a direction normal thereto, and a tension and take-up device comprising a weight supported by the web between said stationary guide and the carriage, said weight movable up and down as the carriage travels from and toward said guide to thereby maintain a continuous tension on the web.

7. The combination of a rotary platen, and means forming a web course over which a web is guided to the platen at the printing line and thence away from the platen, comprising guiding means by which the web is directed to move in a direction parallel with the platen axis, directing means to change the direction of the web to cause it to approach the platen in a direction normal thereto, and means to change the direction

of the web after it has passed the printing line, so that it again advances in a direction parallel with the platen axis.

8. The combination of a paper carriage, and web-guiding means connected to travel with the carriage; said means comprising a guide, over which the web is led and from which it advances in a direction parallel with the direction of the carriage travel, a guide by which the direction of the web is changed to guide the web toward the printing line on the carriage, and a guide by which the direction of the web as it is fed beyond the printing line is again changed to cause it to move in a direction parallel with the direction of the carriage travel.

9. In a typewriting machine, the combination of a paper carriage, web guides extending horizontally from the carriage in a direction perpendicular to the direction of the carriage travel, and intermediate guides, extending diagonally from the outer ends of said first-mentioned guides back to the carriage, said intermediate guides lying one over the other and crossing each other.

10. In a typewriting machine, the combination with a carriage and a roller platen mounted thereon, of web-guiding frames connected to travel with the carriage and each comprising a horizontal guide rod extending rearwardly beyond the platen, and a guide rod extending diagonally forward from the rear end of said first-mentioned rod, said diagonal rods being located one over the other between said horizontal rods and crossing each other substantially at right angles.

11. In a typewriting machine, the combination with a carriage and a rotary platen thereon, of a web-supporting and guiding truck connected to travel with the carriage, web-guiding frames mounted on said truck and comprising guiding rods extending rearwardly from the truck, and diagonal guiding rods extending diagonally forward from the rear ends of said first-mentioned rods and attached at their forward ends to the truck, said diagonal rods being between the first-mentioned rods and crossing each other at an intermediate point.

12. In a typewriting machine, the combination with a carriage, of a work-piece supporting truck, a track on which the truck is mounted to travel with the carriage, means for connecting the truck to travel with the carriage, said connecting means comprising an arm secured to the truck and provided with a hook to engage the carriage, and a locking plate or keeper slidably mounted on said arm to shift toward and from the hook into and out of position to lock said arm to the carriage, and means for actuating said keeper, comprising an actuating rod swiveled thereto, said rod having an offset

portion and a stop cooperating with said offset to lock the rod and keeper, said rod rotatable to release the keeper.

13. In a typewriting machine, the combination with a paper carriage, of a work-piece supporting truck located behind said carriage, a track on which the truck is mounted to travel, connecting arms fixed to the truck and extending forwardly therefrom and provided at their forward ends with hooks to engage a rod on the carriage, locking plates mounted on said arms and movable toward the hooks into position to lock the arms to the carriage, and means for releasably holding said locking plates in locking position.

14. In a typewriting machine, the combination with a paper carriage, of a web-supporting and guiding frame connected to travel with the carriage, a stationary guide from which a web or webs may extend to said web-supporting and guiding frame, a tension and take-up device between said stationary guide and said frame, said device comprising a bar arranged to rest on the webs between said stationary guide and said frame, and upright guides on which said device is mounted to move freely up and down so that the weight thereof is carried by the webs as the carriage moves toward and from said stationary guide.

15. In a typewriting machine, the combination with a carriage, of a platen thereon, means to feed a work-piece over the platen, work-piece feeding means to feed a portion of the work-piece that has advanced beyond the platen, and means actuated by the carriage to automatically operate said last-mentioned feeding means.

16. The combination with a carriage, of a platen thereon, means for guiding a web or continuous work-piece to the platen, web feeding means having a stationary mounting, means to guide the web as it passes beyond the printing line at the platen to said feeding means, line-spacing mechanism to rotate the platen and advance the web thereover, and automatic means for actuating said feeding means.

17. The combination with a carriage, of a platen thereon, means for guiding a web or continuous work-piece to the platen, web feeding means having a stationary mounting, means to guide the web as it passes beyond the printing line at the platen to said feeding means, line-spacing mechanism to rotate the platen and advance the web thereover, and means actuated by the carriage to automatically actuate said feeding means.

18. The combination with a carriage, of a platen thereon, means for guiding a web or continuous work-piece to the platen, web feeding means having a stationary mounting, means to guide the web as it passes beyond the printing line at the platen to said

feeding means, line-spacing mechanism to rotate the platen and advance the web thereover, and means actuated by the carriage at each return movement thereof to drive said feeding means and cause the latter to advance the web a line-space distance.

19. The combination with a carriage, of a platen thereon, means for guiding a web or continuous work-piece to the platen, web feeding means having a stationary mounting, means to guide the web as it passes beyond the printing line at the platen to said feeding means, line-spacing mechanism to rotate the platen and advance the web thereover, and a tension and take-up device interposed between the carriage and said feeding means.

20. The combination with a paper carriage, of a feeding couple toward and from which the carriage travels, and means for guiding a work-piece from the carriage to said feeding couple.

21. The combination with a paper carriage, of a feeding couple toward and from which the carriage travels, means for guiding a work-piece from the carriage to said feeding couple, and means operable automatically by the carriage to drive said feeding couple.

22. The combination with a paper carriage, of line-spacing mechanism to advance a work-piece thereover step by step, a feeding device for the work-piece located beyond the carriage, means for directing the web from the carriage to said feeding device, a take-up device by which slack in the web is taken up as the carriage moves toward said feeding device, and means actuated by the carriage at each return movement thereof to automatically drive said feeding device.

23. The combination with a paper carriage, of line-spacing mechanism to advance a work-piece thereover step by step, a feeding device for the work-piece located beyond the carriage, means for directing the web from the carriage to said feeding device, a take-up device by which slack in the web is taken up as the carriage moves toward said feeding device, and means actuated by the carriage at each return movement thereof to automatically drive said feeding device, the latter arranged to feed the web at each operation a line-space distance equal to a line-space movement of the web at the carriage.

24. The combination with a paper carriage, of means to advance a work-piece thereover, a feeding couple normally stationary during the travel of the carriage, means for guiding a web from the carriage to said feeding couple, means to actuate said feeding couple from the carriage at each return movement of the latter, and a paper severing blade located beyond said feeding couple.

25. The combination with a carriage, of a

platen mounted thereon, means for guiding a web to and around the platen, means for guiding the web as it is fed beyond the platen and changing its direction so that it extends from the carriage in a direction parallel with the carriage travel, web-feeding means located beyond the carriage, means for guiding the printed portion of the web from the carriage to said feeding means, and means operated by the carriage to drive said feeding means.

26. The combination with a carriage, of a platen thereon, means for guiding a series of superposed webs to the platen, means on the carriage for feeding the webs over the platen, a winding roll located beyond the carriage, a stationary support on which said roll is mounted, means for guiding a web or webs from the platen to said roll, and means operated by the carriage to rotate said roll, step by step to wind said web or webs thereon.

27. The combination with a carriage, of a platen thereon, means for guiding a series of superposed webs to the platen, means on the carriage for feeding the webs over the platen, a winding roll located beyond the carriage, a stationary support on which said roll is mounted, means for guiding a web or webs from the platen to said roll, and means to automatically rotate said roll to wind said web or webs thereon.

28. The combination with a carriage, of a platen thereon, means for guiding a series of superposed webs to the platen, means on the carriage for feeding the webs over the platen, a winding roll located beyond the carriage, a stationary support on which said roll is mounted, means for guiding a web or webs from the platen to said roll, means operated by the carriage to rotate said roll, step by step to wind said web or webs thereon, a web feeding device to which the remaining web or webs of said series are guided, and automatic means to actuate said web feeding device concomitantly with the actuation of said winding roll.

29. The combination with a carriage, of a platen thereon, means on the carriage to feed a web over the platen, a web feeding device, means to direct the printed portion of the web from the platen to said device, and means actuated by the carriage to drive said feeding device; said driving means comprising a driver arranged to be actuated by the carriage, a dog carried by said driver, a toothed wheel actuated by said dog, and means for transmitting movement from said toothed wheel to said web feeding device to actuate the latter.

30. The combination with a carriage, of a platen thereon, means on the carriage to feed a web over the platen, a web feeding device, means to direct the printed portion of the web from the platen to said device,

and means actuated by the carriage to drive said feeding device; said driving means comprising a driver actuated by the carriage at each return movement of the latter, a dog carried by the driver, a ratchet wheel driven by said dog, and a gear train connecting the ratchet wheel with said web feeding device.

31. The combination with a carriage, of a platen thereon, means on the carriage to feed a web over the platen, a web feeding device, means to direct the printed portion of the web from the platen to said device, means actuated by the carriage to drive said feeding device; said driving means comprising a driver actuated by the carriage at each return movement of the latter, a dog carried by the driver, a ratchet wheel driven by said dog, and a gear train connecting the ratchet wheel with said web feeding device, a spring to return said driver as the carriage advances in letter-feed direction, and an adjustable stop to variably limit the throw of the driver.

32. The combination with a carriage and a platen thereon, of means to rotate the platen to feed a series of webs thereover, a web feeding couple, a stationary support on which said couple is mounted, a winding roll to receive one of said webs while other of said webs are directed to said feeding couple driving means actuated by the carriage to rotate said winding roll to wind a web thereon, and a gear train between said driving means and said feeding couple for actuating the latter simultaneously with the rotation of the winding roll.

33. The combination with a paper carriage, of a stationary supply roll, means forming a web course over which a web is fed from said roll to the carriage, and a tension and take-up device interposed between said supply roll and carriage.

34. In a typewriting machine the combination with a paper carriage, of means for guiding a web to the carriage, said means comprising a stationary guide and a guide connected to travel with the carriage, the latter guide moving toward and from the first-mentioned guide as the carriage travels back and forth, and a tension device between said guides to maintain a continuous tension on the portion of the web between said guides.

35. In a typewriting machine, the combination with a paper carriage, of means for guiding a web to the carriage, said means comprising a stationary guide and a guide connected to travel with the carriage, the latter guide moving toward and from the first-mentioned guide as the carriage travels back and forth, a tension-and-take-up device comprising a weight resting on the web between said guides, and means for guiding said weight for up-and-down movement as the carriage travels back and forth, whereby

a continuous tension is maintained on the web between said guides.

36. In a typewriting machine, the combination with a carriage and a platen thereon, of means on the carriage to feed a work-piece over the platen, a work-piece feeding device separate from the carriage to feed a portion of the work-piece that has advanced beyond the carriage, and means operated from the carriage at each reciprocation thereof to actuate said feeding device.

37. In a typewriting machine, the combination with a carriage and a platen thereon, of means on the carriage to feed a work-piece over the platen, a work-piece feeding device separate from the carriage to feed a portion of the work-piece that has advanced beyond the carriage, means operated from the carriage at each reciprocation thereof to actuate said feeding device, and manual means for operating said feeding device independently of the carriage travel.

38. The combination with a paper carriage, of a feeding couple toward and from which the carriage travels, means for guiding a work-piece from the carriage to said feeding couple, means operated by the carriage to drive said feeding couple, and a manual device for driving said couple by hand independently of the carriage travel.

39. The combination with a carriage, a platen thereon and line-spacing means to feed a web over the platen, of a feeding couple toward and from which the carriage travels, means for guiding the web from the carriage to said feeding couple comprising a tension-and-take-up device by which a continuous tension is maintained on the portion of the web extending between the carriage and said couple, and means actuated by the carriage to drive said feeding couple.

40. The combination with a carriage and a platen thereon, of means to feed a web over the platen, a stationary frame, a feeding couple thereon, a winding spindle on said frame, a guide arranged to travel with the carriage and over which a web is guided after it passes over the platen, said guide being movable toward and from said winding spindle and feeding couple as the carriage travels back and forth, means for guiding a web between said guide and the winding spindle and feeding couple, a driver-actuated by the carriage for rotating said spindle step by step as the carriage reciprocates, to wind a web on the spindle, and a gear train between said driver and the feeding couple for actuating the latter to feed another web.

41. The combination with a carriage and a platen thereon, of means to feed a web over the platen, a stationary frame, a feeding couple thereon, a winding spindle on said frame, a guide arranged to travel with the carriage and over which a web is guided after it passes over the platen, said guide be-

ing movable toward and from said winding spindle and feeding couple as the carriage travels back and forth, means for guiding a web between said guide and the winding spindle and feeding couple, a driver actuated by the carriage for rotating said spindle step by step as the carriage reciprocates, to wind a web on the spindle, a gear train between said driver and the feeding couple for actuating the latter to feed another web, a tension-and-take-up device arranged to maintain a continuous tension on the portions of the webs extending from the carriage to the winding spindle and feeding couple, and means providing a slip connection between said driver and the winding spindle to permit the surface speed of the roll of web on said spindle to accommodate itself to the speed of said couple, whereby said webs are advanced at the same speed.

42. The combination with a typewriting machine, of a web supporting and feeding attachment therefor located behind the machine and comprising means for supporting, guiding and feeding a web from one end to the other of said attachment over a course whose general direction is parallel with the direction in which the machine carriage travels, and means connected to travel with the carriage to direct an intermediate portion of a web and permit it to be fed over the platen.

43. The combination with a typewriting machine comprising a paper carriage, of a web supporting, guiding and feeding attachment therefor comprising a base located behind the machine, means on said base for supporting a series of supply rolls of web on horizontal axes at right angles to the direction of the carriage travel, means for supporting and guiding said webs comprising guides located laterally beyond the range of the carriage travel, web feeding means to engage the webs beyond said guides and feed the portions of said webs that have advanced beyond the carriage, and means traveling with the carriage for guiding a portion of the webs intermediate said guides and directing the webs over the platen.

44. The combination with a typewriting machine comprising a paper carriage, of a web supporting, guiding and feeding attachment therefor comprising a base located behind the machine, means on said base for supporting a series of supply rolls of web on horizontal axes at right angles to the direction of the carriage travel, means for supporting and guiding said webs comprising guides located laterally beyond the range of the carriage travel, web feeding means to engage the webs beyond said guides and feed the portions of said webs that have advanced beyond the carriage, a track supported on said base, a truck mounted on said track, means connecting said truck to the carriage

to travel therewith, and web supporting and guiding means on said truck by which the portions of the webs intermediate said stationary guides are directed to and from the platen.

45. The combination with a carriage, of a platen thereon, means for guiding a web or continuous work-piece to the platen, web-feeding means having a stationary mounting, means to guide the web as it passes beyond the printing line at the platen to said feeding means, line-spacing mechanism to rotate the platen and advance the web thereover, automatic means for actuating said feeding means, and a slip connection to permit said feeding means to exercise tension on the web sufficient to wind it but insufficient to tear it if the feeding means tends to wind the web too rapidly.
46. The combination with a carriage, of a platen thereon, means for guiding a web or continuous work-piece to the platen, web-feeding means having a stationary mounting, means to guide the web as it passes beyond the printing line at the platen to said

feeding means, line-spacing mechanism to rotate the platen and advance the web thereover, automatic means for actuating said feeding means, a slip connection to permit said feeding means to exercise tension on the web sufficient to wind it but insufficient to tear it if the feeding means tends to wind the web too rapidly, and separate means for maintaining a tension on the web between the feeding means and the platen when the feeding means is ineffective to wind the web.

47. In a typewriting machine, the combination with a carriage, of a platen thereon, means to feed a work-piece over the platen, automatic winding means for winding said work-piece, a slip connection between said winding means and the carriage to prevent excessive tension, and tension-maintaining means adapted to maintain a tension on the work-piece whenever the winding means is ineffective to wind the work-piece.

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