M. E. MELTON.

TYPE WRITING MACHINE.

APPLICATION FILED APR. 26, 1916.

1,317,209.

Patented Sept. 30, 1919.

3 SHEETS—SHEET 1.

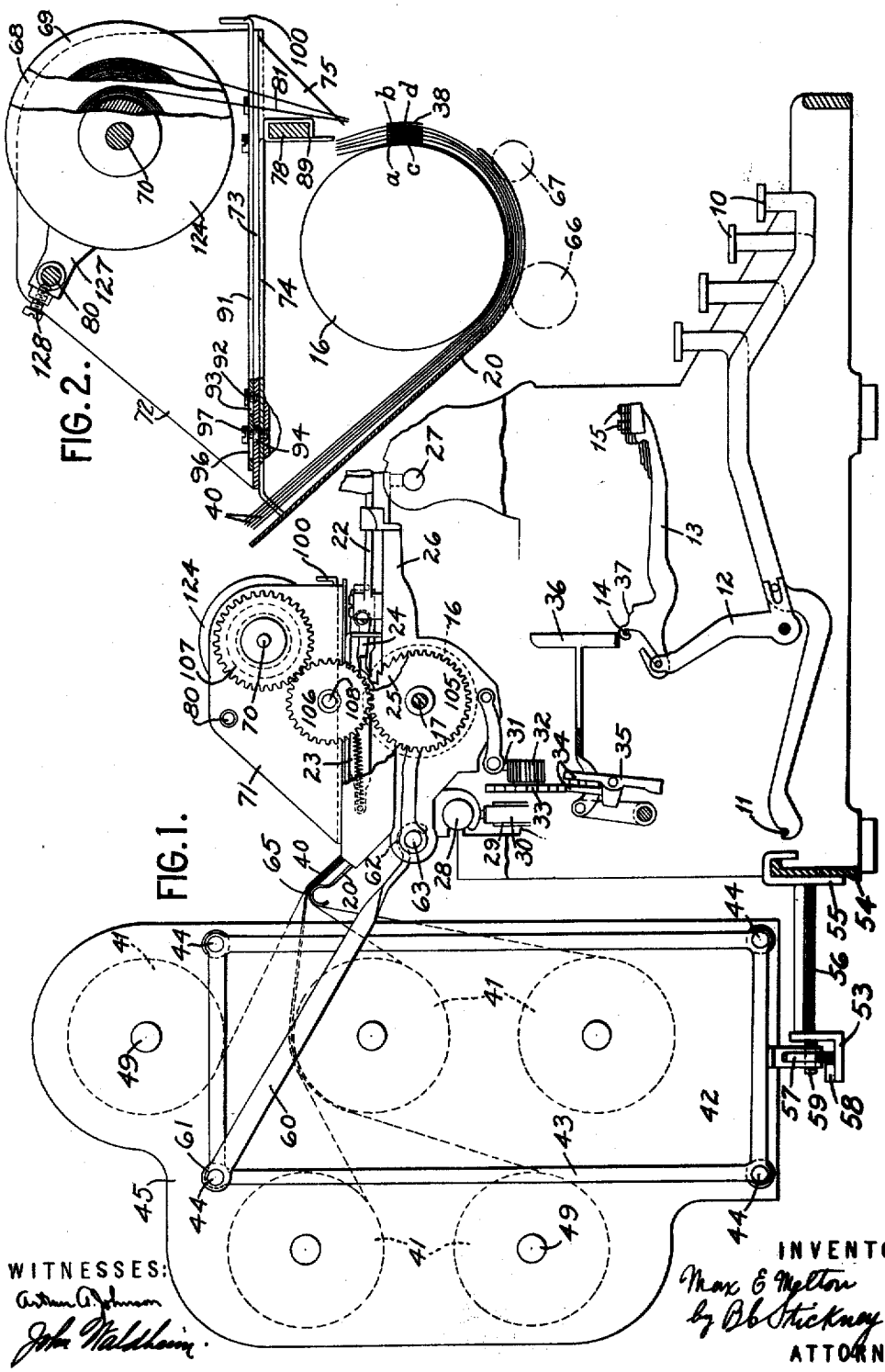


FIG. 2.

FIG. 1.

WITNESSES:

INVENTOR:

ATTORNEY.

M. E. MELTON.

TYPE WRITING MACHINE.

APPLICATION FILED APR. 26, 1916.

1,317,209.

Patented Sept. 30, 1919.

3 SHEETS—SHEET 2.

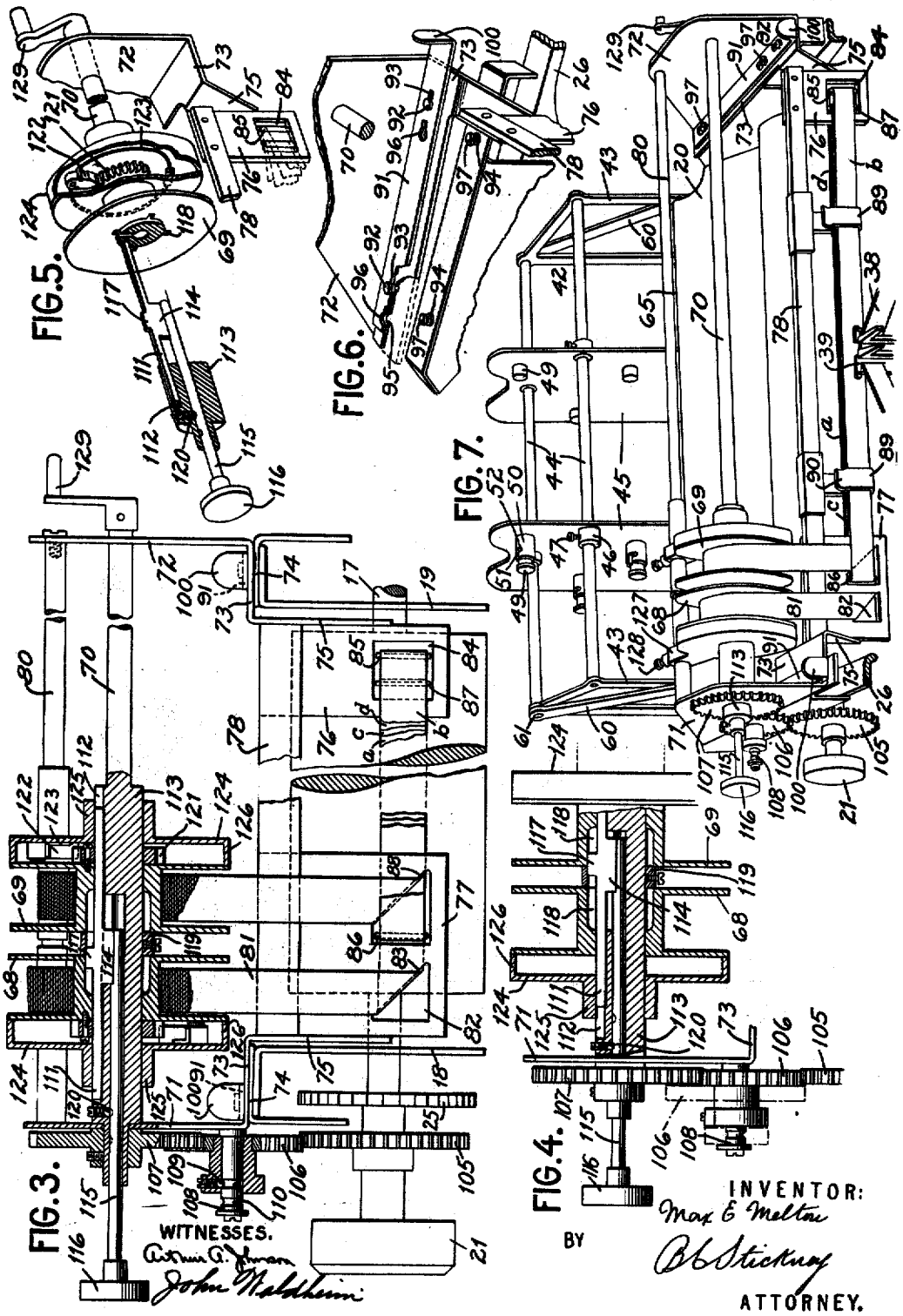


FIG. 5.

FIG. 6.

FIG. 7.

FIG. 3.

FIG. 4.

WITNESSES.

INVENTOR:
Max E. Melton

BY

ATTORNEY.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

M. E. MELTON.

TYPE WRITING MACHINE.

APPLICATION FILED APR. 26, 1916.

1,317,209.

Patented Sept. 30, 1919.

3 SHEETS—SHEET 3.

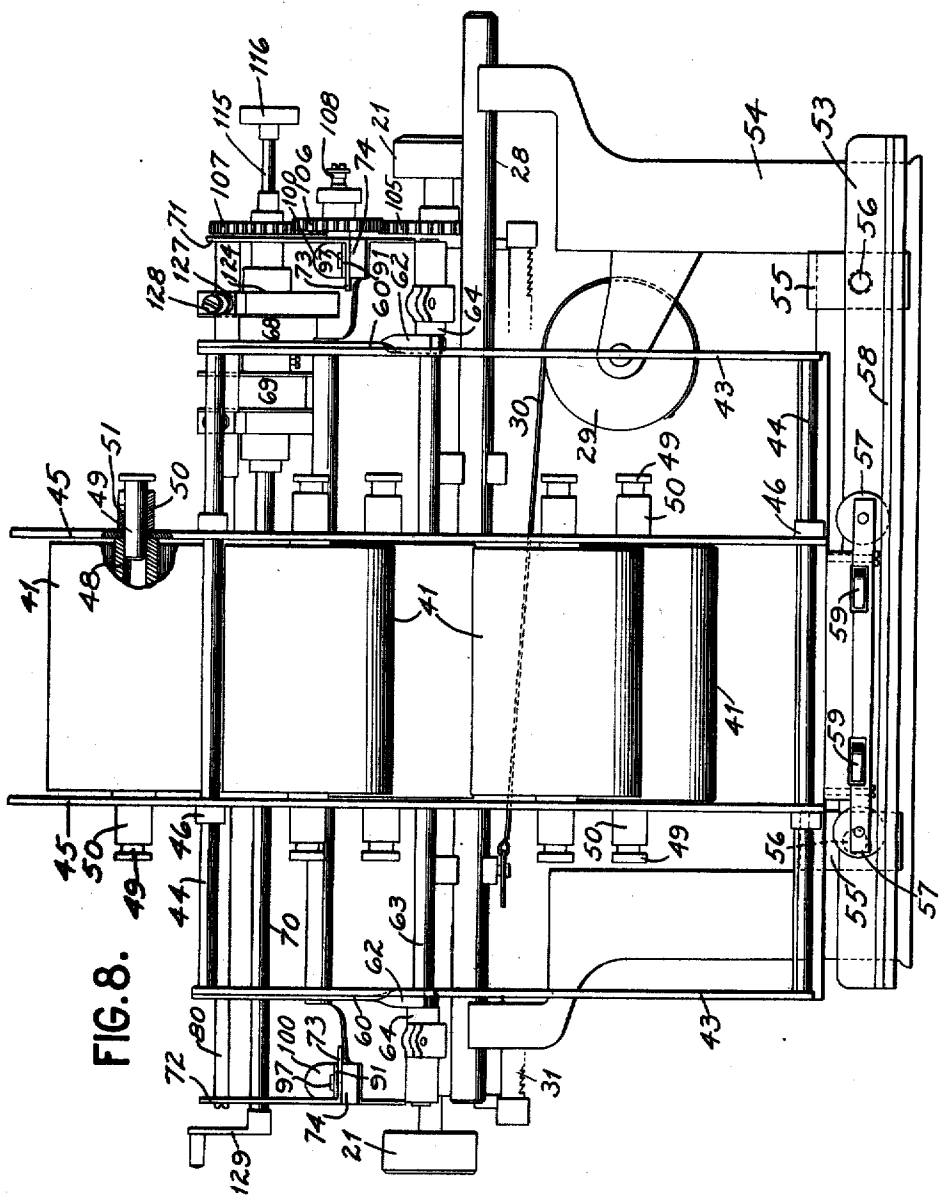


FIG. 8.

WITNESSES:

Arthur G. Johnson

John Waldheim

INVENTOR:

Max E. Melton

BY

R. B. Stickney

ATTORNEY.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MAX E. MELTON, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

1,317,209. Specification of Letters Patent. Patented Sept. 30, 1919.

Application filed April 26, 1916. Serial No. 93,575.

To all whom it may concern:

Be it known that I, MAX E. MELTON, a citizen of the United States, residing in Washington, District of Columbia, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to typewriting machines of the class in which superposed continuous webs of paper (which may be supplied from rolls mounted to travel with the carriage), are fed around the platen past the printing line, being interleaved at the printing line with an inking ribbon. In a machine of this character, an inking ribbon is sometimes supplied from one spool, being guided along the printing line of the platen back and forth as many times as desired, depending on the number of webs of paper, and wound on another spool, the ribbon being fed alternatively from one spool to the other.

A feature of the present invention relates to the compact arrangement of the ribbon mechanism, wherein both the ribbon winding spool and the supply spool are mounted together at one end of the platen for rotation about a common axis. The spools may be mounted on a common drive shaft, which is geared in a simple and convenient manner to the platen for rotation by the latter. A suitable clutch is provided for alternatively connecting the spools to the drive shaft, so that the ribbon may be fed by the line-space rotations of the platen, and the direction of the ribbon feed may be reversed. Means are provided for disconnecting the drive shaft from the platen to permit the latter to rotate independently of the ribbon mechanism, means also being provided to rotate said shaft while thus disconnected, for winding the ribbon on either spool.

Another feature of the invention relates to the mounting of the ribbon spools, the drive mechanism therefor, the ribbon guiding and supporting mechanism, all on a frame removably attached to the usual platen frame, whereby the ribbon mechanism in its entirety may quickly be removed bodily from the machine.

An inking ribbon may be guided lengthwise of the platen along the printing line back and forth between the several webs, and the ends of the ribbon wound on spools mounted side by side on a drive shaft connected through a train of gears to the platen axle. A clutch device for reversing the direction of the ribbon feed, may comprise a key mounted to slide lengthwise of the drive shaft to connect either spool with the drive shaft while releasing the other spool, whereby the ribbon may be fed from either spool and wound on the other spool.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a part sectional end elevation of a typewriting machine, with the present invention applied thereto.

Fig. 2 is a part sectional elevation on a larger scale, partly diagrammatic, showing the ribbon spools and the ribbon supporting frame releasably attached to the platen frame.

Fig. 3 is a part sectional front elevation showing particularly the ribbon spools, the driving mechanism therefor, including the reversing clutch, and the means for guiding the ribbon.

Fig. 4 is a similar view of the ribbon spools, but with the clutch reversed.

Fig. 5 is a fragmentary part sectional perspective view, showing the construction of the ribbon spool and means for connecting it to the drive shaft.

Fig. 6 is a fragmentary view illustrating the means for releasably attaching the ribbon spool frame to the platen frame.

Fig. 7 is a front perspective view showing the ribbon mechanism and the supporting frame for the paper supply rolls.

Fig. 8 is a rear elevation of the machine.

The invention is shown as applied to an Underwood typewriting machine. Keys 10, fulcrumed at 11, operate through bell cranks 12 to swing type-bars 13 upwardly and rearwardly about a fulcrum 14 and cause the types 15 to strike against the front face of the roller platen 16. The platen axle 17 is journaled in the ends 18 and 19 of the platen frame, the latter also including an inclined paper shelf 20 connecting the frame ends, said shelf located at the rear of the platen for supporting and guiding the work to the platen.

The platen may be rotated by hand wheels 21 on the platen axle. The line-spacing mechanism for rotating the platen

to line-space the work, comprises a line-space lever 22 (Fig. 1), operable to move rearwardly a slide 23 carrying a driving pawl 24 to drive a line-space ratchet wheel 25 fixed to the platen axle, to thereby effect line-space rotations of the platen. The platen frame is mounted on a carriage 26, being shiftable up and down thereon to upper and lower-case positions, by means of the usual platen shifting mechanism. The carriage is mounted to travel horizontally on front and rear guide rails 27 and 28, and is driven in letter-feed direction by the usual spring drum 29 (Fig. 8), connected through a band 30 to the carriage.

The letter-feed movements of the carriage are controlled by the usual mechanism, comprising a rack 31 (Fig. 1) on the carriage running in mesh with an escapement pinion 32 which drives an escapement wheel 33 with which coöperate escapement dogs 34 on a dog rocker 35. The dog rocker is actuated by a universal bar 36 which, at each type stroke, is moved rearwardly by a shoulder 37 on the operated type-bar, permitting a letter-space movement of the carriage at each type stroke.

Ribbon mechanism for vibrating a ribbon 38 (Fig. 7) over the printing point at each type stroke, may comprise a ribbon vibrator 39 through which the ribbon is guided, said mechanism being operated in the usual manner. The parts above described may be those usual to the commercial Underwood typewriting machine.

Means for supplying a number of strips or webs 40 to the platen may comprise paper supply rolls 41 removably mounted on a truck 42 arranged to travel with the carriage. As shown, the truck comprises a frame having open rectangular frame ends 43 connected by tie rods 44 extending between the corners of the frame ends. The skeleton frame thus constructed is strong and rigid and at the same time is light in weight and has little inertia, so that it does not materially impede the letter-feed movements of the carriage.

The rolls 41 are supported between plates 45 mounted on the rods 44 and adjustable lengthwise of the rods, permitting adjustment of said plates to rolls of different lengths, and also permitting adjustment of the rolls to any desired position lengthwise of the platen. The rods 44 may extend through collars 46 fixed to said plates, and be provided with set screws 47 by which the plates may be clamped in their adjusted positions on said rods. The paper rolls 41 may be mounted on spools or cores 48 (Fig. 8). Each spool is provided at each end with a central bore or socket to receive stub shafts 49, on which the spool is journaled, said shafts 49 being mounted for endwise movement in the plates 45, into and out of spool-holding position. Said stub shafts may be slidable endwise in bearing sleeves 50 fixed in the plates 45 and each provided with a bayonet slot 51 in which works a pin 52 on the shaft, whereby said shaft may be locked in its spool-holding position. With this construction any roll may be quickly placed in position or removed without interference with the other rolls.

The roll-holding frame or truck is arranged to travel with the carriage 26, so that the rolls may be maintained in operative relation to the platen. For this purpose the truck 42 is mounted to travel on a track comprising an angle-bar 53 located behind the main frame 54 of the machine. Said track is removably mounted on the machine frame by means of brackets 55 which are rigidly connected with the rail 53 by horizontal arms 56. The track may be removed from the machine by simply lifting the brackets 55 off the machine frame. The weight of the roll-holding frame is supported on truck wheels 57 which run on the track 53. Said wheels are prevented from moving rearwardly off the track by a guard rail 58. Horizontal guide rolls 59 are arranged to run on the vertical member of the angle-bar 53.

The roll-holding frame 42 is connected to the typewriter carriage by arms 60, which may be pivoted at 61 to the upper rear corner of the frame, said arms extending forwardly and downwardly from their pivots, and being provided at their forward ends with hooks 62 to engage a shaft 63, which forms part of an Underwood carriage. The hooks 62 may be held against outward movement lengthwise of the shaft 63 by sleeves 64 on said shaft, and are also rigidly held against inward movement along said shaft as they bear against the ends 43 of the roll frame. That is to say, the arms 60 are securely held against endwise play or movement in either direction relative to the roll frame, and endwise movement of the roll frame relative to the platen is also prevented. The webs are thus maintained in a position normal to the platen.

The webs of paper from the rolls 41 are led forward over the rolled or beaded upper edge 65 of the paper shelf 20, which serves as an assembling guide for the webs, the latter being directed downward over the paper table and between the platen and the rear and front feed rolls 66 and 67, and thence upwardly past the printing line. The ribbon 38, above referred to, may serve for printing on the outer web, or on a work-sheet which may overlie the webs at the printing line.

The novel ribbon mechanism comprised in the present invention will now be described. Ribbon spools 68 and 69 are mounted on a ribbon spool drive shaft 70 and are alter-

natively connected to said shaft to be driven thereby through a reversing clutch, as hereinafter described. The drive shaft 70 is rotatably mounted in the ends 71 and 72 of the ribbon supporting frame, which is removably mounted on the platen frame. The frame ends 71 and 72, as shown are each provided with inturned horizontal portions 73 which rest on horizontal portions 74 of the platen frame. The forward end of each horizontal portion 73 is provided with a depending web 75. The web 75 at the right-hand end of the platen frame, is formed integral with an upright ribbon guiding plate 76, just in front of the right-hand end of the platen. The left-hand web 75 likewise carries a ribbon guiding plate 77 projecting downward in front of the left-hand end of the platen. Said guide plates 76 and 77 are connected by a horizontal bar 78 rigidly uniting the ends 71 and 72 of the ribbon supporting frame. Said frame ends are further supported and braced by a tie rod 80 fixed at its ends to said frame ends.

An inking ribbon 81 extends downwardly from the spool 68 and through an opening 82 in the guide plate 77, said opening having a diagonal edge 83 for guiding and changing the direction of the ribbon, a length *a* of which extends from said opening in a horizontal lead along the surface of the platen at the printing line to an opening 84 in the guide plate 76 and around a guide roll 85 mounted at said opening. From thence a length *b* of the ribbon extends back in a horizontal lead to a guide roll 86 in the plate 77, the ribbon continuing around said roll, thence a length *c* extends along the platen in a lead in front of the length *a* to a guide roll 87 in the plate 76, thence a length *d* extends to the left along the platen in front of the length *c* to a diagonal guiding edge 88 in the plate 77, from which the ribbon leads upwardly to the spool 69.

The several webs of paper 40 are interleaved with said lengths of ribbon, so that one length of ribbon overlies each web for printing thereon. The paper webs and the ribbon are held close to the platen along the printing line. To assist in holding the webs and ribbon close together and against the platen, ribbon guides 89 are provided in the form of hooks depending from the bar 78 on which they are slidably mounted for adjustment lengthwise of the platen, so that said guides may be adjusted to correspond to the position and width of the webs of paper. Said guides further serve to prevent the ribbon from sagging, and also prevent it from being dragged either up or down with the paper as the platen is rotated. To prevent the ribbons from being dragged upwardly, the upper ends 90 of the hooks 89 may be bent inwardly to overlie the upper edges of the ribbon. These ends may be sprung outwardly to permit the ribbon to be positioned in or removed from the guides.

The ribbon-supporting frame is removably mounted on the platen frame and may be secured in position thereon by means of locking bars 91. Said locking bars are slidably mounted on the horizontal portions 73 of the ribbon spool frame by means of headed studs 92 (Figs. 2 and 6), fixed in said frame portions, the locking plates 91 being formed with slots 93 through which said studs extend. Studs 94 are secured to the platen frame for holding the ribbon spool frame in position. The studs 94 project through openings 95 in the spool frame and openings 96 in the locking plate 91, said openings 95, 96 being brought in register by sliding the plate 91 forward to the Fig. 6 position. When the spool frame is placed on the platen frame, heads 97 on the studs 94 project upwardly above the locking plate so that when the latter is moved rearwardly, restricted portions of the openings 96 are brought beneath said heads 97, thereby locking the frames together. It will be seen that with this construction the ribbon spool frame, together with the ribbon spools, the ribbon and its guides, may be bodily removed from the machine by simply drawing the locking bars 91 forward by means of the finger pieces 100 and then lifting the ribbon mechanism off the platen.

The spool winding shaft 70 is driven from the platen by means of a gear train, comprising a gear 105 fixed to the platen axle, a gear 107 keyed to the shaft 70, and an idler pinion 106 running in mesh with said gears. The shaft 70 is thus rotated in the same direction as the platen. In order to disconnect the ribbon spool drive shaft from the platen, the pinion 106 is mounted to shift in the direction of its axis on its shaft 108, to the dotted-line position, Fig. 4, out of mesh with the gears 105 and 107. The pinion 106 is held in either of said positions by a spring-pressed detent 109, which seats in annular grooves 110 in the shaft 108.

The ribbon spools are alternatively connected to be driven by the shaft 70, by means of a reversing clutch comprising a key 111 slidably mounted in a slot or key-way 112 extending longitudinally in an enlarged portion 113 of the drive shaft. The key 111 is connected by a web 114 with a stem 115 extending along the axis of the shaft 70, said stem provided with a handle 116 for moving the stem lengthwise of the shaft. The key 111 is provided with a lug or bit 117 adapted to project into any one of a number of slots 118 provided in the inner faces of the hubs of the ribbon spools. When the lug 117 is in one of said slots, the corresponding spool is locked to the shaft to be driven thereby, while the other spool is free to rotate relatively to the shaft, as the key, ex-

cept for the projecting lug 117, lies wholly within the outline of the drive shaft.

Between the two ribbon spools is a collar 119 keyed to the drive shaft, which collar is provided with a slot or guideway in which the lug 117 slides. The collar 119, being wider than the lug 117, serves to space the spools and also to prevent the key 111 from engaging both spools at once, thus relieving them of the strain which would otherwise be placed thereon. The key 111 is held in either of its normal positions by a spring-pressed detent 120 adapted to seat in suitably positioned recesses or notches in the stem 115. Each ribbon spool is prevented from rotating too freely and causing slack in the ribbon, when running idly on the shaft, by means of a tension device comprising a rack or toothed wheel 121 fixed to the spool, and a detent 122 having a stationary mounting and yieldingly held in contact with the rack 121 by a spring 123. Said detent 122 and spring 123 may be mounted on the inner face of a guard plate or disk 124, the latter provided with a hub 125 by which it is mounted on the drive shaft, and a peripheral flange 126 projecting toward the adjoining ribbon spool flange. Each of the plates 124 is provided with an extension 127 having an opening through which the tie rod 80 extends, whereby said plates are prevented from rotating. The plates 124 may be adjusted lengthwise of the drive shaft, so that the flanges 126 fit closely against the spool flanges, providing inclosing casings for the tension devices, and may be locked in adjusted position by means of set screws 128. Movement of the ribbon spools along the shaft is thus prevented.

With the parts in the position shown in Fig. 3, the outer ribbon spool 68 is keyed to the drive shaft, so that at each line-space rotation of the platen, the spool 68 is rotated through a small angle to wind a portion of the ribbon thereon, an equal portion being unwound from the other spool. When it is desired to reverse the direction of the ribbon-feed, the key 111 is shifted to the Fig. 4 position by pressing inwardly on the handle 116, thus disconnecting the spool 68 and connecting the spool 69 with the drive shaft. During this shifting operation, it may be necessary to rotate the spool 69 through a small angle to bring one of the slots 118 therein into register with the lug 117. Said slots 118 may be spaced at short intervals, as indicated in Fig. 5, so that at most a small rotation of the spool is required at any time in reversing the connections. A hand-crank 129 is provided on the drive shaft for winding the ribbon by hand on either spool, the pinion 106 being shifted to the dotted-line position in Fig. 4 when it is desired to wind the ribbon by means of a crank.

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 revoluble platen, of means for supporting and guiding an inking ribbon extending lengthwise of the platen over the printing line in a plurality of leads, ribbon spools on which the ends of the ribbon are wound, a drive shaft on which the spools are mounted side by side, means for alternately connecting the spools to be driven by said shaft, and a gear train connecting the platen and the said drive shaft, comprising gears secured to the platen and drive shaft, respectively, and an intermediate gear shiftable into and out of position to transmit motion from the platen to the drive shaft.

2. In a typewriting machine, the combination with a revoluble platen, of a ribbon winding spool, a drive shaft for rotating said spool, gears connected, respectively, to the said drive shaft and the platen axis, and an intermediate pinion shiftable on its axis into and out of position to transmit motion from one to the other of said gears.

3. In a typewriting machine, the combination with a platen and a platen frame, of a second frame comprising a drive shaft adapted to be detachably mounted on said platen frame, ribbon spools mounted side by side on said shaft, and a key shiftably mounted on said shaft for movement into positions for alternately locking said spools to the drive shaft.

4. In a typewriting machine, the combination with a traveling carriage and a drive shaft thereon, of ribbon winding spools mounted adjacent each other thereon, said shaft having a key-way therein, a key slidable longitudinally of the shaft in said key-way, said spools having hubs formed with slots extending lengthwise of the shaft, said key having a projecting lug, means for shifting said key to move said lug into engagement with a slot of either spool and thereby lock the spool to the shaft, and a spacing collar keyed to the drive shaft between said spools, and provided with a key-way for said lug, so that said collar may hold said lug clear of either spool.

5. In a typewriting machine, the combination with a traveling carriage, of a ribbon spool driving shaft on said carriage provided with a central bore extending longitudinally thereof, said shaft formed with a radial slot extending from said bore to the periphery of the shaft, a key finger-piece having a stem slidably mounted in said bore, said key slidable in said radial slot and having a lug projecting beyond the surface of the shaft, and ribbon spools mounted side by side on said shaft and formed with guideways in the hubs thereof into which said

lug may be alternately shifted, thereby alternately connecting the spools to be driven by said shaft.

6. In a typewriting machine, the combination with a platen, of line-spacing means for rotating the platen, ribbon spools located at one end of the platen, means for guiding a ribbon from one spool to the printing line of the platen, and thence lengthwise of the platen back and forth in a plurality of leads, and to the other ribbon spool, a drive shaft on which said spools are mounted, mechanism, at the end of the platen adjacent said spools, operated by said line-spacing means to drive said shaft, and means to releasably connect each spool to be driven by said shaft.

7. In a typewriting machine, the combination with a platen frame and a revoluble platen therein, of ribbon spools on one end of said frame having a common axis of rotation, means for guiding a ribbon from one spool over the printing point and back to the other spool, line-spacing means to rotate the platen, mechanism for transmitting motion from said line-spacing means to said spools, and means for alternatively disconnecting said spools from the line-spacing means.

8. In a typewriting machine, the combination with a revoluble platen, of ribbon spools having a common axis of rotation, means for guiding a ribbon from one spool over the printing point and back to the other spool, line-spacing means to rotate the platen, mechanism for transmitting motion from said line-spacing means to said spools, means for alternatively disconnecting said spools from the line-spacing means, means for concomitantly disconnecting both ribbon spools from the line-spacing means, and a device for rotating said spools independently of the line-spacing means.

9. In a typewriting machine, the combination with a platen and platen frame, of a ribbon-spool supporting frame removably mounted on the platen frame, locking studs on one of said frames, and a locking bar on the other frame shiftable into and out of position to lock the said supporting frame to the platen frame.

10. In a typewriting machine, the combination with a platen frame and a platen, of a ribbon-spool supporting frame removably mounted on the platen frame, said supporting frame having portions resting on the platen frame ends, locking studs on the platen frame ends having heads projected through openings in said portions of the supporting frame, and locking bars mounted on said supporting frame and slidable thereon into and out of locking engagement with the heads on said studs for locking the frames together.

11. In a typewriting machine the combination with a platen frame and a platen mounted thereon, of a ribbon-spool supporting frame, having frame ends at the ends of the platen frame, said supporting frame comprising a bar extending lengthwise of the platen and rigidly uniting said frame ends, and ribbon guide plates depending from said bar and comprising means for supporting and guiding a ribbon extending lengthwise of the platen along the printing line in a plurality of leads.

12. In a typewriting machine, the combination with a platen frame and a platen mounted thereon, of a ribbon-spool supporting frame, having frame ends at the ends of the platen frame, said supporting frame comprising a bar extending lengthwise of the platen and rigidly uniting said frame ends, ribbon guide plates depending from said bar and comprising means for supporting and guiding a ribbon extending lengthwise of the platen along the printing line in a plurality of leads, and ribbon guides slidably mounted on said bar and adjustable therealong.

13. In a typewriting machine, the combination with a platen, of a ribbon-spool supporting frame, ribbon spools mounted thereon, said frame having means for guiding a ribbon from one spool to the printing line and back and forth along the printing line in a plurality of lengths and to the other ribbon spool, said frame comprising a bar extending lengthwise of the platen and connecting the frame ends, and ribbon guides slidably mounted on said bar for adjustment lengthwise of the platen, said guides arranged to engage said lengths of ribbon and hold them together and close to the platen along the printing line.

14. In a typewriting machine, the combination with a rotary platen, of means for supporting and guiding an inking ribbon extending in a plurality of lengths along the platen at the printing line, a bar extending lengthwise of the platen above said lengths of ribbon, and ribbon supporting and guiding hooks depending from said bar and arranged to support said lengths of ribbon and prevent them from sagging, and also hold them compactly along the printing line.

15. In a typewriting machine, the combination with a rotary platen, of means for supporting and guiding an inking ribbon extending in a plurality of lengths along the platen at the printing line, a bar extending lengthwise of the platen above said lengths of ribbon, and ribbon supporting and guiding hooks depending from said bar and arranged to support said lengths of ribbon and prevent them from sagging, and also hold them compactly along the printing line, the hooks having offset portions to overlie the upper edges of the ribbon and thereby prevent the ribbon from being ac-

cidentally displaced or dragged upwardly out of the hooks by the advancing work-pieces.

16. In a typewriting machine, the combination with a platen and a platen frame, of a ribbon-spool supporting frame adapted to be detachably supported on said platen frame, a drive shaft thereon, ribbon spools mounted side by side on said drive shaft adjacent one end of the spool frame, said frame having ribbon guides at opposite ends of the frame by which the ribbon is guided in a plurality of leads back and forth between the frame ends, and a single set of gearing on said spool frame adapted to be geared to the platen to drive both spools.

17. In a typewriting machine, the combination with a platen and a platen frame, of ribbon spools located adjacent to each other on one end of the platen frame, means for guiding a ribbon from one spool to the printing line of the platen, and thence lengthwise of the platen and back, and thence to the other ribon spool, so that the same ribbon serves for two work-sheets, said spools mounted on a common drive-shaft, means for alternatively connecting said spools to be rotated by the drive-shaft, a gear on said drive-shaft, a gear fast to the platen, and a pinion between said gears for driving one by the other.

18. In a typewriting machine, the combination with a revoluble platen and a frame in which it is mounted, of a second frame detachably connected to said platen frame, said second frame including means for supporting and guiding an inking ribbon extending lengthwise of the platen, over the printing line in a plurality of leads, ribbon spools on which the ends of the ribbon are wound, a drive-shaft on which the spools are mounted side by side, means for alternatively connecting the spools to be driven by said shaft, and a gear train connecting the platen and the drive-shaft comprising a gear secured to the platen, a gear secured to the drive-shaft, and an intermediate gear journaled on said second frame and shiftable on said frame into and out of position to transmit motion from the platen to the drive-shaft.

19. In a typewriting machine, the combination with a revoluble platen and a frame in which it is mounted, of a second frame detachably secured to said platen frame, said second frame comprising a ribbon-winding spool, a drive-shaft for rotating said spool, and a gear connected to said drive-shaft for rotating said spool, there being also a gear secured to the platen, and an intermediate pinion journaled on said detachable frame and shiftable on its axis on said frame, into and out of position to transmit motion from one to the other of said gears.

20. In a typewriting machine, the combination with a platen frame and a platen journaled therein, of a second ribbon-spool supporting frame detachably supported on said platen frame, said second frame having frame ends at the ends of the platen frame and comprising a bar extending lengthwise of the platen and rigidly uniting said frame ends, ribbon-guide plates depending from said bar and comprising means for supporting and guiding a ribbon extending lengthwise of the platen along the printing line in a plurality of leads, and ribbon-guides slidably mounted on said bar and adjustable therealong.

21. In a typewriting machine, the combination with a platen and a platen frame, of a second ribbon-spool supporting frame detachably supported on said platen frame, ribbon spools mounted thereon, said second frame having means for guiding a ribbon from one spool to the printing line and back and forth along the printing line in a plurality of lengths and to the other ribbon spool, said second frame comprising a bar extending lengthwise of the platen and connecting the frame ends, and ribbon-guides slidably mounted on said bar for adjustment lengthwise of the platen, said guides arranged to engage said lengths of ribbon and hold them together and close to the platen along the printing line.

22. In a typewriting machine, the combination with a platen frame and a platen journaled therein, of a second ribbon-spool supporting frame detachably supported on said platen frame, said second frame having frame ends at the ends of the platen frame and comprising a bar extending lengthwise of the platen and rigidly uniting said frame ends, and ribbon-guide plates supported from said bar and comprising means for supporting and guiding a ribbon extending lengthwise of the platen along the printing line in a plurality of leads.

23. In a typewriting machine, the combination with a platen and a platen frame, of a second ribbon-spool supporting frame detachably supported on said platen frame, said second frame including means for supporting and guiding an inking ribbon extending in a plurality of lengths along the platen at the printing line, a bar extending lengthwise of the platen above said lengths of ribbon, and ribbon-supporting and guiding hooks depending from said bar and arranged to support said lengths of ribbon and prevent them from sagging and also hold them compactly along the printing line.

24. In a typewriting machine, the combination with a platen and a platen frame, of a second ribbon-spool suporting frame detachably supported from said platen frame, said second frame including means for supporting and guiding an inking ribbon extending in a plurality of lengths along the

platen at the printing line, a bar extending lengthwise of the platen above said lengths of ribbon, and ribbon-supporting and guiding hooks depending from said bar and arranged to support said lengths of ribbon and prevent them from sagging and also hold them compactly along the printing line, the hooks having offset portions to overlie the upper edges of the ribbon and thereby prevent the ribbon from being accidentally displaced or dragged upwardly out of the hooks by the advancing work-pieces.

MAX E. MELTON.

Witnesses:
EDWIN C. JAMES,
GEORGE G. WARD.

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