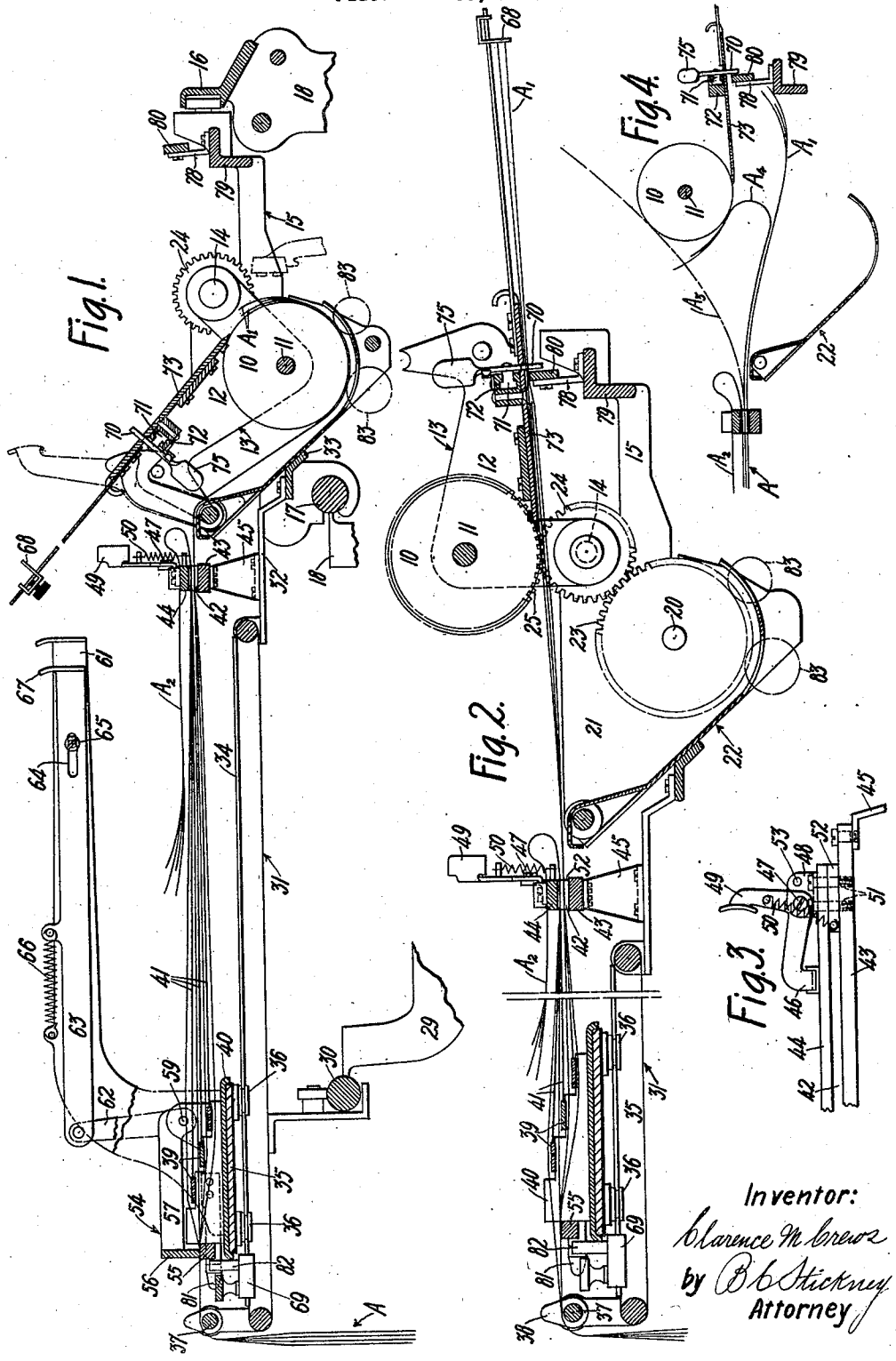
Dec. 8, 1925. 1,564,408

C. M. CREWS

TYPEWRITING MACHINE

Filed Nov. 15, 1923 2 Sheets-Sheet 1



Dec. 8, 1925.

1,564,408

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TYPEWRITING MACHINE

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2 Sheets-Sheet 2

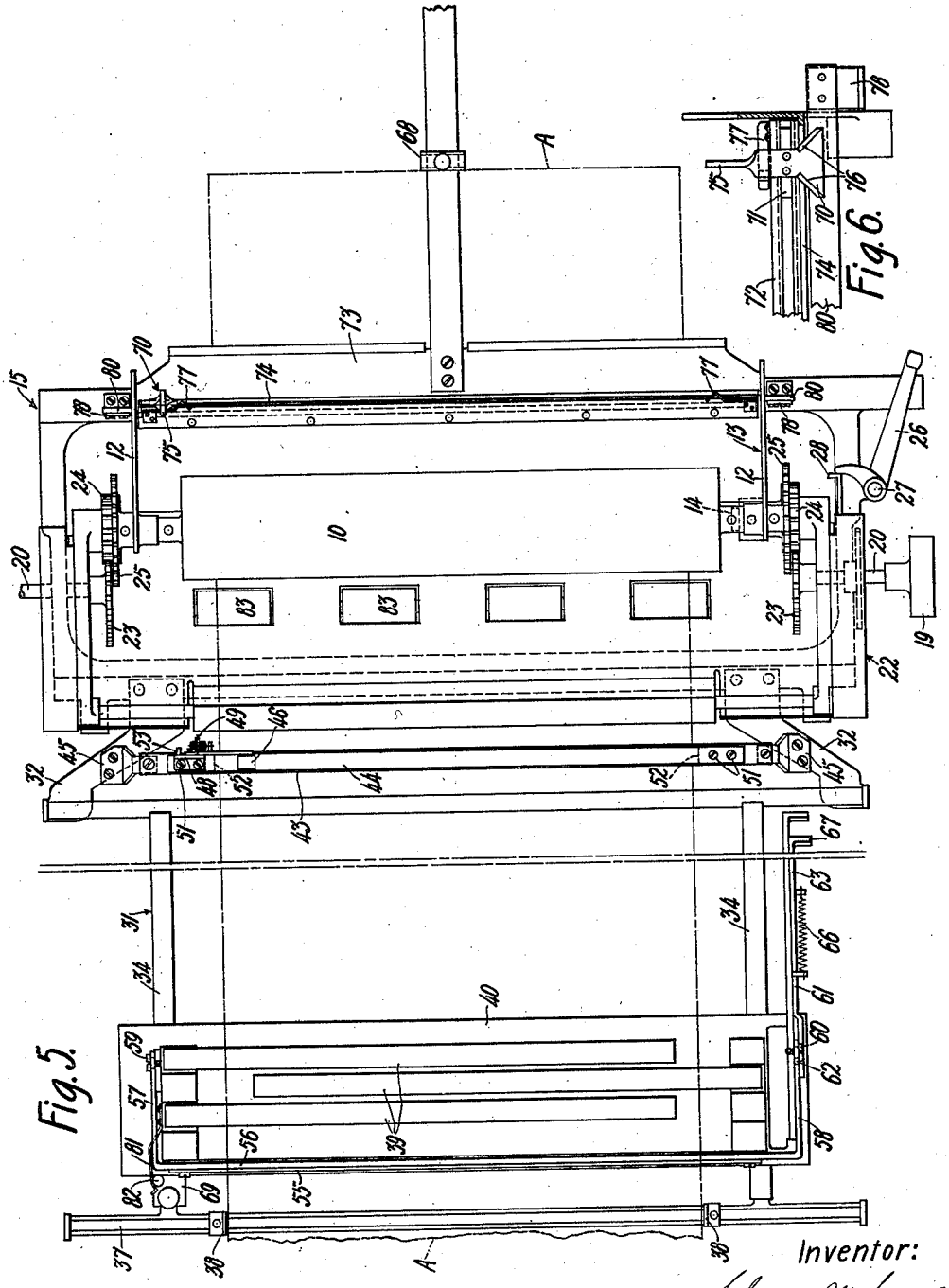


Fig. 5.

Fig. 6.

Inventor:
Clarence M Crews
by R C Stickney
Attorney

Patented Dec. 8, 1925. 1,564,408

UNITED STATES PATENT OFFICE.

CLARENCE M. CREWS, OF BROOKLYN, NEW YORK, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPEWRITING MACHINE.

Application filed November 15, 1923. Serial No. 674,839.

To all whom it may concern:

Be it known that I, CLARENCE M. CREWS, a citizen of the United States, residing in Brooklyn Borough, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Typewriting Machines, of which the following is a specification.

This invention relates to performing upon continuous work-webs, by the use of interleaved carbons, classes of manifold work wherein the number of carbon copies required of successive writing varies. The machine of the present invention may be used also like any continuous billing machine for continuous billing work or other similar work in which the number of carbon copies is always the same.

It is an object of the invention to provide a machine for applying the carbon-shifting principle of the continuous billing machine to work in which varying numbers of copies of the writings are required. To do this work, which may be the writing of telegrams or letters, for example, separate continuous work-webs (preferably as many as can be typed at a single writing) are led through a carbon-carrier reciprocable toward and from the platen, and some of them are then led forward around the platen. In order that the number of webs in active use at a writing may be varied, in accordance with the needs of the work, provision is made of means, for example a clamp, in which the forward ends of any desired number of the webs, interleaved with the carbons of the carbon-carrier, may be secured without being passed around the platen. Preparatory to the typing of the first writing and while the webs are free of the platen, the number of copies required of the first writing is determined by the operator. He then counts off as many of the webs as are provided in excess of the number of copies required, turns them back and secures them in the web-holding means to be held idle and out of the way during typing. The platen, which may be displaceable as in the Underwood continuous billing machine, is then lowered and the writing is typed on the active webs. When the typing of the first web-section is completed, the platen is displaced, the active webs are drawn forward to a gauge at the front of the machine, and the carbon-carrier is thrust to the rear to strip the carbons from the typed sections of the active webs. At this time the typed portions of the webs are inverted or face down, and the same is also true of the work-table which normally extends back from the delivery side of the platen.

In the usual continuous billing machine, it would be necessary to lower or restore the platen preparatory to tearing off the typed web-sections. In order to change the number of webs in active use the platen would have to be again displaced after the tearing off to free the webs from the platen so as to permit a part of the previously active webs to be turned back into the clamp, or a part of the previously inactive webs to be withdrawn from the clamp and turned forward beneath the platen.

To avoid the need for displacing the platen twice, provision is made in the present machine of means for severing the typed web-sections after the carbons have been retracted, but before the platen has been lowered. For this purpose a draw-knife is slidingly mounted upon the back of a front paper-table of the machine for movement parallel to the platen, the knife being normally beyond the bounds of the work-webs. The knife extends through a slot in the paper-table to the front thereof, and is arranged to be drawn along the slot to engage the work-webs on the front of the table to shear them. A bar is mounted on the front rail of the carriage against which the portion of the front paper-table adjacent the slot is moved when the platen is displaced. The paper-table may be pressed down by the operator after the carbons have been retracted to clamp the work-webs between the bar and the table, so as to hold the webs stationary during web-severing. It will be seen that the number of webs in active use may be changed without displacing the platen a second time, the procedure being to displace the platen, gage the work-webs, retract the carbons, sever the typed web-sections, change the number of webs and carbons in active use, and lower the platen to writing position.

One feature of the invention relates to means for keeping the inactive work-webs out of the way during the typing of the active webs. As the typing progresses the carbon-carrier is drawn forward by the ac-

tive webs toward the platen. At the same time the slack inactive webs and carbons form a loop between the carbon-carrier and the clamp. In order to prevent obstruction of the work by the formation of this loop too near the platen, bars are mounted at the rear of the carriage to extend across all of the webs above and below them and near enough to each other to form a restricted passage for the webs. The arrangement is such that the active webs, which are straight and taut, are pulled forward by the platen through this opening without opposition, but the slack inactive webs are prevented from passing. The loop in the inactive webs is thus caused to form to the rear of the bars in a location where it will not interfere with the work.

It is important to prevent shifting of the inactive webs with relation to the carbons and to the active webs as the carbon-carrier travels forward at line-spacing, since such shifting would cause the carbons to become wrinkled, would prevent the forward edges of the inactive webs when turned to active position from coinciding with the forward edges of the already active webs, and would cause the printed forms on the webs to get out of register. Accordingly a clamp is provided on the carbon-carrier for clamping the active and inactive webs to the carbon-carrier and to each other during writing. A handle is provided for opening the clamp to permit relative movement of the work-webs and carbons in the carbon-shifting operation.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a fragmentary sectional side elevation of a machine embodying the present invention, showing the work in first writing line position.

Figure 2 is a view similar to Figure 1, showing the platen displaced, the work-webs gaged and the carbon-carrier retracted. The typed web-sections are positioned for severing by the knife.

Figure 3 is a detail front elevation, showing the arrangement of the clamp for holding the inactive webs to the rear of the platen, and the bars for preventing the formation of the loop in the inactive webs too far forward in the machine.

Figure 4 is a sectional side elevation, showing the platen displaced, and illustrating particularly the way in which the inactive webs may be thrust forward when released from the clamp to associate them with the already active webs.

Figure 5 is a plan view of the machine with the platen displaced.

Figure 6 is a detail view showing the construction and mounting of the novel knife.

The machine of the present invention is similar in many features to the Underwood continuous billing machine, as disclosed, for example, in the patent to Wernery & Smith, No. 1,132,055, granted March 16, 1915.

A cylindrical platen 10 is secured upon an axle 11 by which it is journaled in end plates 12 of a swing-frame 13 which is pivotally mounted on stub-shafts 14 carried by a traveling carriage 15. The carriage 15 is mounted for letter-feed and return movements upon a front rail 16 and a rear rail 17 supported upon the main frame 18 of the machine. Platen-turning knobs 19 (one of which is shown) are mounted upon stub-shafts 20 journaled in the ends 21 of the platen-frame 22, and each may be operated to transmit motion to the platen 10 through a gear 23 fast on one of the stub-shafts 20, a broad pinion 24 co-axial with the swing frame 13, and a second gear 25 upon the adjacent end of the platen. The broad pinions 24 and the swing frame 13 are not mounted at the opposite ends of a shaft extending completely across the machine as is usual, but are journaled instead on the stub-shafts 14 carried by the ends of the platen-frame so as to leave the front of the platen clear, and thereby to facilitate the withdrawal of active webs A_1 from beneath the displaced platen, and the insertion of inactive webs A_2 beneath it. In addition to the platen-turning knobs 19, mechanism is also provided for line-spacing the platen 10 which comprises a line-space lever 26 pivoted at 27 on the carriage 15 and a line-space slide 28 operated by the lever 26. The machine also includes a rear extension 29 of the main frame 18 having a rear rail 30 which helps to support a rear carriage extension 31. The rear carriage extension 31 includes brackets 32 secured to a bar 33 on the carriage 15 and rails 34 on which the carbon-carrier base 35 is mounted by means of rolls 36 to travel toward and from the platen 10. A large number of separate work-webs A is led over a bar 37 at the rear of the carriage extension 31 between side guides 38 and thence forward between carbon-holding blades 39 of a carbon-carrier 40. The carbon-carrier 40 is preferably detachably mounted on the base 35, as disclosed in the patent to Fortin, No. 1,237,319, granted August 21, 1917, so that carbon-carriers having different kinds of work-webs interleaved with their carbons may be interchanged in the machine. The work-webs A and interleaved carbons 41 pass forward from the carbon-carrier 40, through a restricted opening 42 formed by two spaced parallel bars 43 and 44 that are mounted on upstanding brackets 45 on the brackets 32 and extend completely across the work-webs A. Beyond the bars, some of the webs, designated by A_1, pass down

and around the platen to the front thereof for writing. Such of the webs A as are not required for the particular writing in hand are folded back over the upper bar 44 and are secured in an inactive position, as indicated at A_2, by a clamp jaw 46 which co-operates with the upper bar 44 at one end thereof. The jaw 46 is pivoted at 47 upon a bracket 48, and the clamp also comprises a bell-crank handle 49 for the swinging jaw 46 and a spring 50 connected to the handle and to another part of the carriage extension. The spring 50 is arranged to cross the pivot 47 of the swinging jaw 46 as said jaw is swung from active to inactive position, and hence tends to retain the jaw in either of said positions. Screws 51 pass through the bracket 48, the bar 44, a spacing block 52, and the bar 43 to retain all of these members in assembled relation. A stop 53 on the bracket 48 limits the opening of the swinging jaw 46.

As the typing of the active webs A_1 proceeds, these webs with their carbons 41 are line-fed, and this line-feeding draws the carbon-carrier 40 forward toward the platen with the result that the inactive webs A_2 and their carbons 41 in advance of the carbon-carrier are caused to form a loop. The parallel bars 43 and 44 tend to prevent the passage of the slack inactive webs A_2 from rear to front, but oppose no obstruction to the pulling forward of the straight active webs A_1 by the platen. The loop is therefore formed to the rear of the bars 43 and 44 and not in a position where it will interfere with the operation of the machine. As the carbon-carrier 40 is drawn forward there is a tendency of the idle work-webs A_2 to lag behind the carbon-carrier and this lagging, if permitted to occur, is apt to cause the carbons 41 to become wrinkled and to cause the forms on the active and inactive webs to shift out of register. In order to prevent such shifting of the inactive work-webs A_2 with reference to the idle carbons 41 and to the active webs A_1, a clamp 54 is provided on the carbon-carrier 40 to clamp all of the work-webs A, both active and inactive, to the carbon-carrier and to each other during writing operations. The clamp 54 comprises a stationary jaw 55 mounted on the carbon-carrier and extending from side to side thereof beneath the webs A, and a movable jaw 56 parallel to said stationary jaw 55 and having forwardly-extending arms 57 and 58 at its opposite ends, pivoted respectively on a shouldered screw 59 on the carbon-carrier, and a shouldered screw 60 on the carbon-carrier handle 61. A bell-crank arm 62 extends upwardly from the arm 58 and is pivoted at its upper end to a handle 63. The handle 63 is mounted for sliding movement along the carbon-carrier handle 61 by means of a slot 64 in the handle 63 and a headed stud 65 on the carbon-carrier handle. A spring 66 connected to the handle 63 and to the carbon-carrier handle 61 normally draws the handle 63 to the rear to hold the clamp 54 closed, and a finger-piece 67 on the handle 63 adjacent the forward end of the carbon-carrier handle 61 may be drawn forward to open the clamp 54 to permit relative shifting of the work-webs and the carbons between writings.

When the typing of the first web-section is completed the platen 10 is displaced, the active webs are drawn forward to a gage 68 and the carbon-carrier 40 is thrust to the rear against an adjustable stop 69 to shift the active carbons from between the typed web-sections and to position them between the next untyped sections on the active webs. In order that the typed web-sections may be severed at this stage, without lowering the platen, provision is made of novel web-severing means. A draw knife 70 is mounted upon a T-shaped block 71 slidable in a channel-bar 72 on the back of a front paper-table 73 which forms a part of the swing frame 13. The knife 70 extends through a slot 74 in the front paper-table 73 and may be drawn, by a handle 75, completely across the path of the work-webs A_1. The knife has two shearing edges 76, so that it may be drawn across the table in either direction to shear the work-webs. The channel-bar 72 is rather heavy, and is secured firmly to the paper-table 73 to reinforce it in the web-shearing operation. Spring-detents 77 are mounted adjacent the opposite ends of the slot. Either of these detents 77 is effective to yieldingly retain the knife 70 at one end of its travel beyond the bounds of the work-webs A_1.

It is important that the work-webs A_1 be held against shifting or slipping during web-severing. Upstanding brackets 78 are mounted upon the front bar 79 of the carriage 15, at its opposite ends, and these brackets support a bar 80 against which the front table 73 may be pressed during the severing operation to clamp the work-webs A_1 firmly adjacent the path of the knife 70.

After the severing of the typed web-sections, the operator next determines the number of copies required of the next writing and adjusts the number of webs in active use accordingly. Should he find it necessary to reduce the number of webs in active use, he counts off the surplus webs from the webs A_1 extending beneath the platen and turns them and their carbons 41 back under the clamp-jaw 46. Should he find it necessary, on the other hand, to increase the number of webs in active use he counts from the inactive webs A_2, under the clamp-jaw 46, the additional webs

required and turns them forward beneath the platen 10. When these webs are first released from the clamp they occupy the position indicated at A_3. The operator then tucks them beneath the platen with his fingers, to a position like that indicated at A_4, and when the webs have been pushed forward far enough they snap forward to the position indicated at A_1. The leading edges of these webs register exactly with the leading edges of the webs A_1 already in active use, since they were severed by the knife 70, when last previously in active use, under exactly the same conditions which exist at every subsequent severing operation.

It will be noticed that the knife 70 is located a substantial distance up the front paper-table from the platen. Provision is made of means for drawing the leading ends of the webs A_1 down to first writing line position automatically, at the lowering of the platen. For this purpose a spring-detent 81 is provided on the carbon-carrier 40 to engage a pin 82 on the adjustable stop 69 that limits the rearward movement of the carbon-carrier. This detent 81 prevents forward movement of the carbon-carrier 40 during the downward movement of the platen to lowered position, until the feed-rolls 83 engage the platen. The platen, therefore, as it bends the work-webs A_1 in returning to lowered position, causes their leading edges to be drawn down from the knife 70 and locates the webs in the usual first writing line position, as seen in Figure 1. The platen engages the feed-rolls 83 shortly before it comes to rest, causing the feed-rolls to grip the work-webs A_1 forcibly to the platen. The platen is rotated in line-feed direction throughout its movement from displaced to lowered position, and hence in the last part of its movement coacts with the feed-rolls 83 to draw the carbon-carrier 40 forward to free the detent 81 from the pin 82. It is unnecessary, therefore, for the line-spacing of the platen to overcome the force of the detent 81.

It will be seen that by the provision in the present machine of means for facilitating and expediting the change of the number of webs in active use, the carbon-shifting principle of the fan-fold machine may be applied to numerous classes of work wherein the operator has been compelled heretofore to interleave the individual work-sheets and carbons.

The bottom webs are apt to be used up faster than the upper webs, but this is unobjectionable, inasmuch as the webs are led separately into the machine, each web being supplied independently of the remaining webs. When the supply of one web is exhausted, a new web may be put in to take its place, without wasting any of the remaining webs.

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 having a revoluble platen, means for presenting to the platen a composite web of work-plies and interleaved carbons, including a carbon-carrier or holder, said machine constructed to permit the straightening out of the web preparatory to stripping the carbons, a web-severing device comprising a draw knife movable transversely of the web, and a work-support, said work-support being normally out of use, but the work-support and the draw knife being brought into co-operative web-severing relation at the operation of the machine to straighten out the web.

2. In a typewriting machine having means for typing and feeding superposed continuous work-webs, and a carbon-carrier for holding carbons interleaved with the webs, and shiftable relatively to the webs to strip the carbons from the typed web-sections, said machine affording a straightening-out of the web preparatory to stripping the carbons, the combination of means for severing the typed web-sections from the remainder of the webs, and a work-support co-operating with said severing means; said work-support and said severing means being normally separated during the typing operation and mounted to be brought into co-operative relation at the movement of the machine to straighten out a web.

3. In a typewriting machine having a revoluble platen and means for presenting multiple-ply work-webs thereto and for typing upon the webs, including a carrier for holding carbons interleaved with the webs, said machine having members relatively displaceable for straightening out the webs to afford relative stripping movement between the carbon-carrier and the webs, means for severing the webs transversely, said severing means having members brought into co-operative relation at the platen-displacing operation of the machine preparatory to carbon-stripping, said severing members being out of a co-operative relation when said machine is in typing condition.

4. In a typewriting machine having a revoluble platen, and having means for presenting to the platen superposed plies of work-webs and for typing thereon, said presenting means comprising a carrier for holding carbons interleaved with the webs, said platen being displaceable for straightening out of the composite webs preparatory to stripping the carbons from the typed

portions of the webs, and for freeing said composite webs from the platen, a reciprocatory web-severing device normally inaccessible and movable with the platen to accessible position at the platen-displacing operation and including means mounted in position for severing the typed web-sections while said members are so displaced, and, while the composite webs are free from the platen, thus permitting any selected number of work-web plies with their carbons to be turned back to inactive position preparatory to the typing of the remaining web-section.

5. In a typewriting machine, in combination, a revoluble platen, a carbon-carrier reciprocable toward and from the platen for holding carbons interleaved with superposed continuous work-webs, means for elevating the platen for freeing the carbons on the carbon-carrier from the platen and to enable the carbons to be straightened out and shifted relatively to the work-webs, a paper-table at the front of the platen, having a slot therein extending longitudinally of the platen, a knife mounted on the back of the paper-table for sliding movement along the slot, the knife extending through the slot to the front of the table to sever the webs upon the front of the table when the members are in web-straightening positions, and work-supporting means for co-operation with said slot, said knife and said supporting means normally apart but brought together at the elevation of the platen.

6. In a typewriting machine, in combination, a front paper-table having a slot therein extending longitudinally of the platen, and a web-severing knife mounted on the back of the paper-table for sliding movement along the paper-table from side to side thereof, the knife projecting through the slot to sever the work on the paper-table by such movement.

7. In a typewriting machine, in combination, a front paper-table having a slot therein extending longitudinally of the platen, a knife-supporting guide on the back of the paper-table flush with one edge of the slot and in supporting relation thereto, a knife mounted for movement along the guide and projecting through the slot to the front of the paper-table to sever the work on the table and a work-support between which and the table the work advances.

8. In a typewriting machine, in combination, a revoluble platen, an invertible table at the delivery side of the platen, a channel-bar at the delivery side of the platen and extending longitudinally thereof and mounted on said table, a block mounted at the back of the table for sliding movement along the channel-bar, a knife back of the table and mounted on the block and operable along the bar to sever work-webs when the table is inverted, and a work-support between which and said bar the work advances.

9. In a typewriting machine, in combination, a displaceable, revoluble platen, a work-table at the delivery side of said platen, a carbon-carrier movable toward the platen at line-spacing and from the platen when the platen is displaced to shift the carbons relatively to the work-webs, a knife at said work-table and substantially in advance of the printing line on the platen and operable to sever the work-webs while the platen is displaced, and while the carbons extend in advance of said printing line, said knife mounted at the delivery side of the platen and on the same side of the web as the platen, and rendered accessible by the displacement of the platen, means for receiving any selected number of the work webs with their interleaved carbons at the conclusion of the web-severing operation, and arranged to retain said work-webs and carbons in inactive position during the typing of the next writing, and means for securing the inactive webs against shifting relatively to the active webs during writing.

10. In a typewriting machine, a revoluble platen, a carbon-carrier, a knife movable to sever work-webs, means for displacing the platen to straighten out the work-webs, and means for clamping the work-webs stationary adjacent the path of the knife during web-severing, said clamping means including co-operative members separated when the platen is in printing position but connected to be brought into effective relation at the platen-displacing movement

11. In a typewriting machine, a revoluble platen, a swing frame in which the platen is journaled, a front paper-table forming part of the swing frame, a knife movable along the paper-table parallel to the platen, and a bar against which the paper-table may be moved by movement of the swing frame, and arranged to engage the paper-table adjacent the path of the knife, the construction and arrangement being such that the swing frame may be pressed to clamp the work-webs stationary between the bar and the paper-table for severing.

12. In a typewriting machine, in combination, a swing frame, a revoluble platen journaled therein, a knife arranged to sever work-webs when the platen is displaced, and means made effective by pressure on the swing frame to clamp the work-webs stationary for severing.

13. In a typewriting machine, in combination, a displaceable, revoluble platen, a web-severing knife located a substantial distance above the platen for severing work-webs when the platen is displaced, a carbon-carrier reciprocable toward and from the plat-

en, means for detaining the carbon-carrier at the rear limit of its movement during the lowering of the platen to cause the leading ends of the work-webs to be drawn down from the knife to first writing line position, and means for pulling the carbon-carrier free of said detaining means in the final portion of the platen's movement to lowered position.

14. In a typewriting machine, in combination, a displaceable, revoluble platen, a web-severing knife located a substantial distance above the platen for severing work-webs when the platen is displaced, a carbon-carrier reciprocable toward and from the platen, means for detaining the carbon-carrier at the rear limit of its movement during the lowering of the platen to cause the leading ends of the work-webs to be drawn down from the knife to first writing line position, gears for rotating the platen throughout its movement to lowered position, and feed-rolls engageable by the platen in the last part of its movement to lowered position, to grip the work-webs to the rotating platen, the arrangement being such that the carbon-carrier will be automatically pulled free of its detaining means after the platen engages the feed-rolls.

15. In a typewriting machine, a revoluble platen, a paper-table at the front of the platen, a knife mounted on the back of the paper-table and extending to the front thereof for severing work-webs at the delivery side of the platen, a handle for the knife behind the paper-table, and means for swinging the paper-table forward to a position wherein the knife-handle will be readily accessible to the operator.

16. In a typewriting machine, in combination, a displaceable, revoluble platen, a web-severing knife located a substantial distance above the platen for severing work-webs when the platen is displaced, a carbon-carrier reciprocable toward and from the platen, an adjustable stop for limiting the rearward movement of the carbon-carrier, and means on said adjustable stop for detaining the carbon-carrier at the rear limit of its movement during the lowering of the platen, to cause the leading ends of the work-webs to be drawn down from the knife to first writing line position.

17. In a typewriting machine having a revoluble platen, and also having a carriage for the platen and a work-shelf at the delivery side of the platen, means for presenting to the platen a composite web of work-plies and interleaved carbons, including a carbon-carrier or holder, said machine constructed to permit the straightening out of the web preparatory to stripping the carbons, a web-severing device comprising a draw knife mounted upon said work-shelf under the work, and a work-support mounted upon said carriage forwardly of the platen and normally idle; the platen being displaceable, together with said shelf, at the platen-displacing operation, and said knife and said work-support being thereby brought into co-operative relation.

18. In a typewriting machine having a revoluble platen, and also having a carriage for the platen and a work-shelf at the delivery side of the platen, means for presenting to the platen a composite web of work-plies and interleaved carbons, including a carbon-carrier or holder, said machine constructed to permit the straightening out of the web preparatory to stripping the carbons, a web-severing device comprising a draw knife mounted upon said work-shelf under the work, a work-support mounted upon said carriage forwardly of the platen and normally idle; the platen being displaceable, together with said shelf, at the platen-displacing operation, and said knife and said work-support being thereby brought into cooperative relation, and means at the intake side of the platen for detaining one or more web-plies after the severance of the typed web and prior to the restoration of the platen to typing position.

19. In a typewriting machine, in combination, a revoluble platen, a carbon-carrier to hold carbons interleaved with loose continuous work-webs, all forming a work-unit and permanently carried in the machine, means for displacing the platen whereby the webs may be straightened preparatory to stripping the carbons, means accessible for severing the typed work-web sections from the webs while straightened out, thus permitting a selection of how many of the carried work-webs are to be typed and how many are not to be typed at the next writing, after the finished web-sections have been severed but while the webs are in stripping position, said knife mounted at the delivery side of the platen and on the same side of the web as the platen, and rendered accessible by the displacement of the platen, and means for detaining any number of the work-webs with their interleaved carbons selected at the conclusion of the web-severing operation, during the typing and line-spacing of the next section of web.

CLARENCE M. CREWS.