Feb. 23, 1932. O. THIEME 1,846,285

TYPEWRITING MACHINE

Filed March 29, 1928 2 Sheets-Sheet 1

FIG. 1.

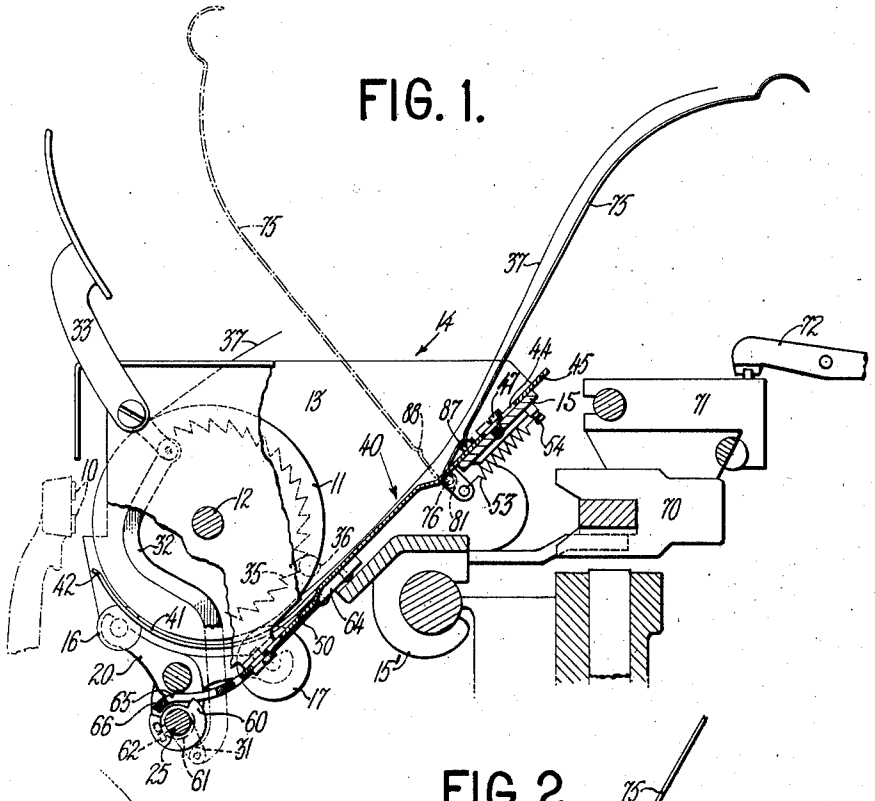


FIG. 2.

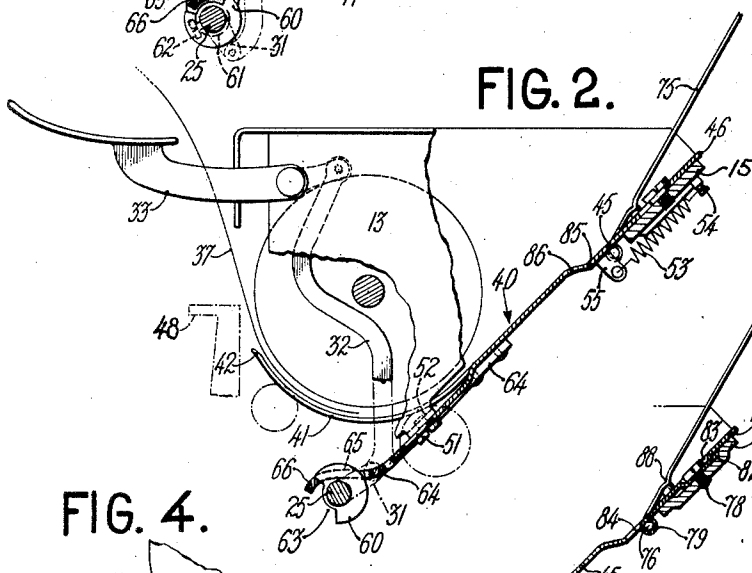


FIG. 3.

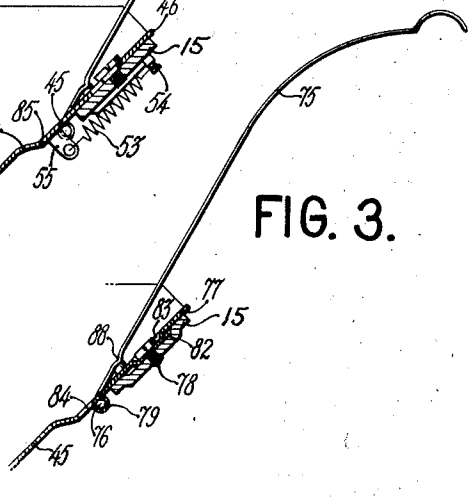
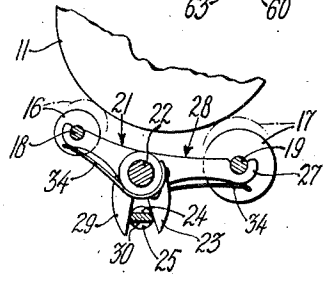


FIG. 4.



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TYPEWRITING MACHINE

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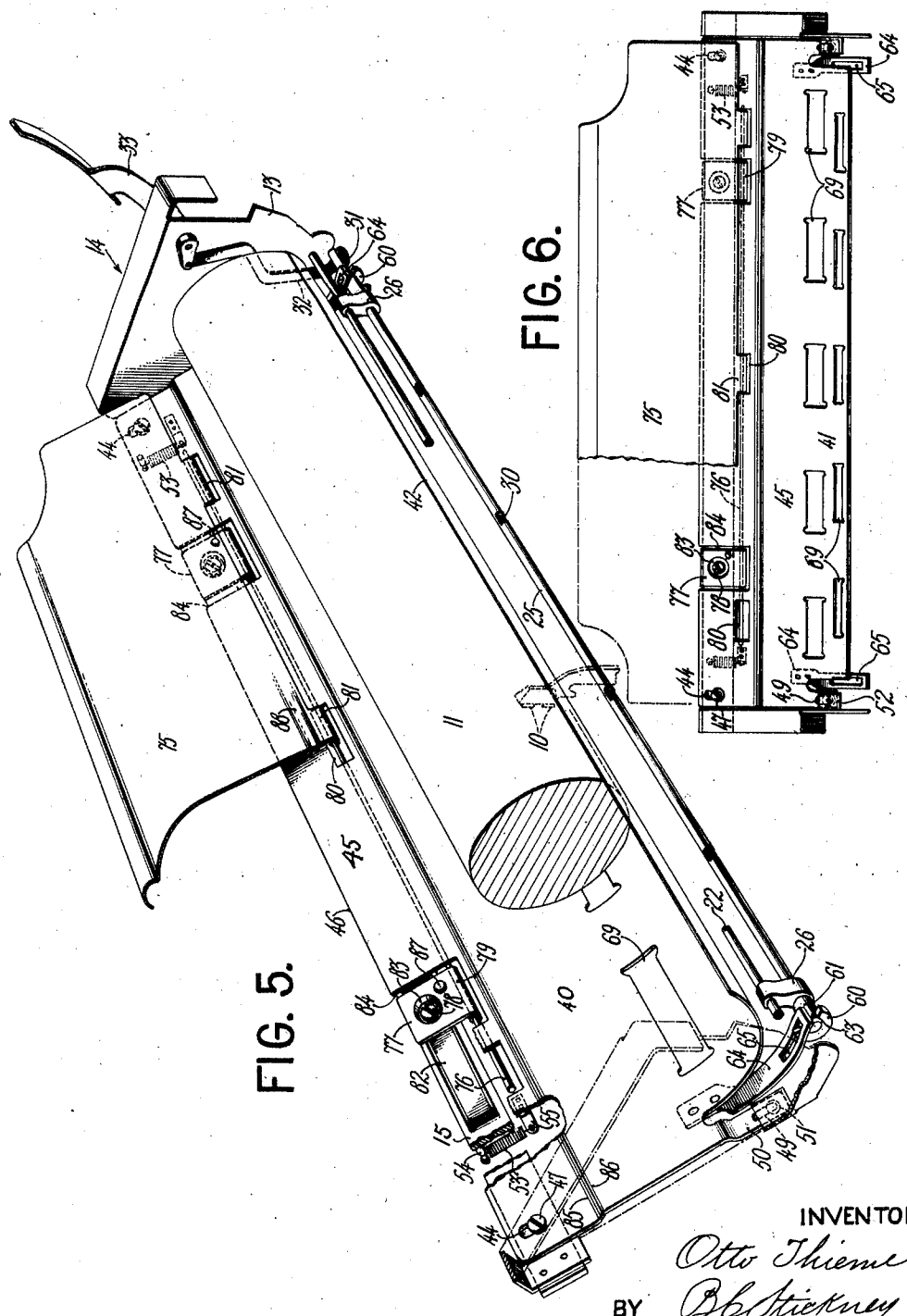


FIG. 5.

FIG. 6.

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UNITED STATES PATENT OFFICE

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TYPEWRITING MACHINE

Application filed March 29, 1928. Serial No. 265,561.

This invention relates generally to typewriting machines, and more particularly to the paper-table at the introductory side of the typewriter platen.

It is often convenient in typing certain kinds of work-sheets, such as statements and the like, to insert the sheets at the front of the platen, and it is usual to increase the gap or opening between the platen and the apron which extends forward from the rear paper-table, by moving the apron down away from the platen.

Devices for attaining this end have been proposed which were operated by the usual feed-roll-release lever at the same time the feed-rolls were being released. As a result of using such devices, a considerable increase in force was required to operate the feed-roll-release lever which was objectionable especially in the case of long-platen machines, where an additional force was already required for swinging the extra number of feed-rolls away from the platen against spring pressure.

A feature of the present invention resides in the provision, in a typewriting machine, of means operatively connected to the feed-roll-release lever which are effective for moving the apron of a slidably mounted rear paper-table away from the platen for inserting a work-sheet therebetween, the connection of said lever to said table-moving means permitting the latter to be idly affected until the movement of the feed-rolls away from the platen has been substantially completed.

Another feature of the invention lies in the novel method of connecting the paper-table to the feed-roll-release device, so that greater movement of the paper-table is secured to facilitate inserting work-sheets. This is especially desirable when the work-sheets are inserted from the front.

Tabulating mechanism for typewriting machines is commonly mounted at the rear of the carriage, and the rear paper-table usually overhangs the tabulating mechanism. To make this mechanism more accessible, the overhanging portion of the rear paper-table is often pivotally fastened to the remaining lower fixed portion so that it can be swung forward to uncover the tabulating mechanism. It is another feature of the present invention to provide means for pivotally mounting the upper section of the rear paper-table of the present invention whereby it will not interfere with the slidably mounted lower portion when operated to move the apron away from the platen.

In carrying out my invention, which is illustrated as applied to an Underwood typing machine, a body-portion of a paper-table having a forwardly-extending integral apron is slidably mounted for moving the apron down away from the platen. A pinton-member mounted on the usual feed-roll-release shaft, adjacent each end thereof, has a lost-motion operative engagement with a rack-member fastened to the slidably mounted paper-table at each side thereof. The lost-motion coaction of the two pinion-members with the two rack-members fastened to the paper-table permits the latter to remain still until the movement of the feed-rolls away from the platen is substantially completed. Springs on the platen-frame are effective to return the slidably mounted body-portion and apron to normal position as the feed-rolls are restored to effective position against the platen.

An upper extension of the rear paper-table is hinged on a lateral rod which is fastened under the upper end of the body-portion of the paper-table and is carried by brackets which are mounted on a cross-bar between the sides of the platen-frame, the hinged mounting of the upper extension permitting the latter to lie swung forward to give access to usual tabulating mechanism in the rear of the carriage.

Another feature of the present invention resides in the provision of means for preventing the upper hinged portion of the rear paper-table from pinching or binding the slidably mounted lower body-portion, which, should it occur, would seriously interfere with the sliding function of the body-portion.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a fragmentary cross-sectional view, front to rear, through an Underwood combined typewriting and computing machine having my invention applied thereto. In this view, the lower feed-rolls and the slidably-mounted apron are shown in their normal positions.

Figure 2 is a view similar to Figure 1, the lower feed-rolls and the apron being shown in their displaced positions.

Figure 3 is a detail view illustrating a means for preventing an upper pivoted section of the rear paper-table from binding a lower slidable section of the table.

Figure 4 is a fragmentary, diagrammatic view illustrating a method of displacing the lower feed-rolls.

Figure 5 is a fragmentary, perspective view of the platen-frame of an Underwood combined typewriting and computing machine, having my invention applied thereto.

Figure 6 is a top view, partly broken away, of the rear paper-table of the present invention mounted on the platen-frame of an Underwood combined typewriting and computing machine.

The present invention is illustrated as applied to an Underwood combined typewriting and computing machine, in which types 10 strike against a platen 11 mounted on a shaft 12, journaled in side plates 13 of a platen-frame 14, which is mounted on a laterally-movable carriage 15'. Front feed-rolls 16 and rear feed-rolls 17 are mounted on feed-roll shafts 18 and 19, respectively. The shaft 18 is journaled in the forward ends of arms 20 of bell-cranks 21, the latter being pivotally mounted on a cross-rod 22 fastened between the side plates 13. A depending arm 23 of each bell-crank 21 normally engages against a cam-flat 24 cut in the rear side of a feed-roll release shaft 25, which is journaled in hangers 26 fast on the cross-rod 22. The shaft 19 is journaled in the rear ends of arms 27 of bell-cranks 28 which are pivotally mounted on the cross-rod 22. A depending arm 29 of each bell-crank 28 normally engages against a cam-flat 30 cut in the forward side of the shaft 25. An integral crank-arm 31 is provided on the right end of the shaft 25 and is connected by a link 32 to a feed-roll release lever 33. Leaf-springs 34 are effective for normally urging the feed-rolls 17 and 18 against the platen. Instrumentalities for line-spacing the platen may include a ratchet-wheel 35 and a detent roller 36 engaging between the teeth of the ratchet-wheel. The parts described hereinbefore may be of the same construction as like parts in an Underwood standard combined typewriting and computing machine.

For inserting a work-sheet 37 around the platen 11, there is provided a rear paper-table generally designated as 40, which extends downwardly and forwardly under the platen and terminates in an apron-extension or paper-deflector 41 at the forward side of the platen. A front edge 42 of the apron may be bent slightly forward a short distance below the usual type-guide 48 to form an entrance throat. The portion of the apron 41 adjacent the edge 42 is pressed lightly against the platen by devices hereinafter described.

To provide an opening or gap between the apron 41 and the platen 11 for easily inserting the work-sheet 37 at the front of the platen, means are provided for mounting the paper-table 40, so that it can be slid forward and downward to move the apron 41 away from the platen. In carrying out this feature of the invention two elongated guide-slots 44 are cut in the upper section 45 of the table 40 near its upper rear edge 46, one slot being disposed adjacent each of the side plates 13, and the long axes of the slots are disposed substantially parallel to the side plates. Shoulder-screws 47 pass through the slots 44, and are threaded in a cross-bar 15 which is fast between the side plates 13 and is disposed in a downwardly-inclined plane. An elongated guide-slot 49 is cut in each of two fingers 50 which are integral with the lower edge of the plane portion of the body 40, one at each side thereof. The fingers 50 extend forwardly and downwardly from their junctions with the body 40 in a plane parallel to the plane of the cross-bar 15, and a shoulder-screw 51 passes through each slot 49 and is threaded in an inreaching flange member or ear 52 integrally joined to the adjacent side plate 13. The flanges 52 are disposed parallel to the upper face of the bar 15, so that the paper-table 40 may be slid in a forwardly and downwardly inclined plane without binding or warping.

A tensile spring 53 is positioned at each side of the table 40 and has one end fastened to a pin 54 in the bar 15, and the other end to a perforated ear 55, which is riveted to the lower side of the table 40. The springs 53 will have a sufficient initial tension to hold the apron lightly against the platen and the table 40 in its normal uppermost position, which is determined by the lower ends of the slots 44 engaging against the screws 47.

Means for moving the apron away from the platen concomitantly with the operation of the feed-roll release lever include two pinion-like members 60 mounted on the shaft 25, one adjacent each end thereof, by means of a hub 61 and a set screw 62. Each pinion-member 60 may take the form of a roller or disk mutilated by a notch 63 formed by cutting away a portion of the member. To co-operate with each pinion-member 60 a metal bar or strap 64 is riveted to the body-section of the table at each side thereof and extends down-

wardly therefrom. The upper portion of each strap is disposed in substantial alignment with the plane portion of the body-section 40. The lower forward portion of each strap in normal position is curved slightly up to pass over the shaft 25, and then curves a short distance forward and downward substantially parallel to the periphery of the shaft (Figure 1). Each strap 64 has a lengthwise slot 65 which engages about the associated pinion 60, so that an extreme end portion 66 of the strap which is disposed in front of the slot will lie in the sector-like notch 63 and serves as a tooth element for engagement with the pinion-member. This arrangement of the strap 64 and the pinion-member 60 forms a kind of rack-and-pinion mechanism. It will be noted that in the normal (upper) position of the paper-table 40 (Figure 1) the edge of the pinion-member 60 at the right of the notch 63 is positioned to the right of the tooth element 66 of the strap 64 a considerable angular amount, measured about the axis of the shaft 25 as a center. By this arrangement, the pinion-members 60 will idle during the first part of the downward movement of the feed-roll-release lever 33. It will be further noted (see Figure 4) that practically all of the work of releasing the feed-rolls is done during the first part of the movement of the lever 33 when the pinion-member is moving idly. Thus the above-described construction for moving the apron 41 away from the platen upon operation of the feed-roll-release lever 33 is effective to do its work without appreciably increasing the degree of force required for operation of the lever when moving the feed-rolls alone. This is a desirable feature especially on the long-platen typewriting machines where the movement of the additional feed-rolls requires a considerable extra force.

A much wider parallel gap or opening between the paper-table 41 and the platen 11 having been provided by operation of the above-described means, the work-sheet 37 may be easily inserted at the front of the platen and slid around the platen rearwardly to bring the first writing line to printing position. The feed-roll-release lever may now be reversely operated, which will restore the feed-rolls to effective position. The springs 53 are now effective to slide the apron 41 and table 40 back to normal position as fast as the pinion-member is rotated backwards, i. e., clockwise. It will be noted that in the feed-roll-restoring operation of the lever 33 the actions of the springs 53 are effective to decrease the amount of force required to rotate the cam-shaft 25 and operate the lever, since the tooth-element 66 of the strap 64 is pulled by the springs against the portion of the pinion-member 60, which is disposed on the right or clockwise side of the sector-like notch 63, thus tending to rotate the pinion 60 and shaft 25 in the same direction as does the lever 33. Should the springs 53 at any time be unable to return the table to normal upper position the left-hand edges of the notches 63 will abut against the tooth-element 66 and push the straps and table upwardly.

To permit the feed-rolls 16 and 17 to engage against the platen, opening 69 may be cut through the table 40 and because of the sliding action of the latter the dimensions of the slots in a front-to-rear direction are slightly greater than is usual.

It can be readily seen that, without departing from the scope of the present invention, the rack-and-pinion organization of the strap 64 and pinion-member 60 may be varied by adding more teeth and notch elements in both the strap and the pinion-member for moving the apron a greater distance from the platen than is possible by the use of one tooth and one notch element.

An Underwood combined typewriting and computing machine is usually provided with tabulating mechanism in the rear of the carriage, which includes usual column-stops 70, tappets 71 and jacks 72. To permit access to this tabulating mechanism, it is common to hinge the upper part of the usual rear paper-table to a fixed lower part so that the upper part can be swung forward. It is a feature of the present invention to provide means for hinging an upper extension 75 of the paper-table 40 to the carriage, so that it can serve as a substantially flush continuation of the body-portion 45 and yet permit the latter to be slid down and up for moving the apron 41 away from and toward the platen 11. To this end a pivot-rod 76 is mounted adjacent the lower side of the cross-bar 15 parallel thereto on brackets 77, which are fastened by screws 78 to the cross-bar. A lower end portion 79 of each bracket is curved tightly around the rod 76 and holds it rigidly just below the lower surface of the body-portion 45. A plurality of rectangular apertures 80 are cut through the paper-table body-portion 45 over the rod 76 and integral tongues or fingers 81 on the lower edge of the upper extension 75 extend down through the apertures 80 and are bent loosely around the rod 76 and serve as hinges.

To give the cross-bar 15 additional stiffness, it may be formed with a shallow integral lengthwise channel trough 82 of a well-known construction. The brackets 77 may have circular recesses 83 formed therein, which are seated in the channel 82 and which receive the screws 78 and permit their heads to be substantially flush with the upper faces of the brackets. The upper portion 45 of the paper-table body 40 lies in substantially the same plane as the brackets 77, cutouts 84 being made in the upper rear edge 46 of the body 45 to receive the brackets and permit movement of the body relative thereto. A short distance downwardly toward the platen from

the lower edge of the cross-bar 15, the paper-table body 40 is bent upwardly at 85 and then downwardly at 86 to help to guide the rear edge of a work-sheet past the lower hinged end of the upper section 75 when the work-sheet is inserted at the front of the platen and passed rearwardly over the paper-table.

It can be seen by inspection of Figures 1 and 3 that the weight of the upper overhanging portion of the upper paper-table section 75 will tend to bind the sliding body-portion 45 against the cross-bar 15 should the upper section come against the body-portion. To prevent this binding, an upwardly-projecting stud 87 is fastened in each of the brackets 77, and serves to space the upper table-section 75 slightly above the underlying upper end portion of the body 45, so that the latter will not be pressed down against the cross-bar 15.

The upper paper-table section 75 is preferably made of thin sheet-metal, and, to strengthen the metal where it engages against the studs so that it will not be bent or warped or otherwise damaged, a shallow depending rib or bead 88 is formed in the metal to extend across the section 75. The rib may have a V-shaped cross-section with its downwardly-extending apex resting on the studs 87. When the upper section 75 is swung forward to the position indicated by the dot-and-dash representation of the section (Figure 1) to give better access to the tabulating mechanism, the section is supported in its forwardly displaced position by engagement of the fingers 81 against the metal at the forward edge of apertures 80.

It will be understood that, according to the usual practice, the paper apron or guide has been curved forwardly under the platen for the entire length of the latter, and has occupied about the same position as occupied by the paper-apron 41 at Figure 2 of the present drawings, that is, so far from the platen as to accommodate a large number of sheets. This has, however, been found unsatisfactory in many cases, and too great remoteness of the paper-apron from the platen has not been compensated for by merely using the feed-rolls 16 and 17 to press a thin pack of sheets or a single sheet directly against the platen.

According to the present invention, the paper-apron 41 may occupy a position remote from the platen, as in Figure 2, and thereby accommodate a thick pack of sheets; but at the same time it is capable of occupying a position close to or against the platen as at Figure 1, when only a single sheet is being typed. In other words, the paper-table is self-accommodating to the thickness of the work, and at all times it hugs the work to the platen, which affords a great advantage, since the work, whether one or many sheets, is not only held by the feed-rolls but is also held yieldingly by this paper-apron, which accommodates itself to the work and presses evenly thereon. The springs 53 serve to draw the paper-apron up at each side against the under front side of the platen, where it is most useful in hugging the paper to the platen; and the forward tip of the paper-apron may clip the paper to the platen after it has passed the front bottom pressure-roll 16, which is a desideratum. The tension of the springs 53 needs not be very strong, and needs not to interfere substantially with the adjustment of the paper edgewise while it is upon the platen, but it still may be strong enough to aid substantially in controlling a thick pack of sheets.

It will be noted that the assembly of the parts provides for the approximate adjustment of the paper-table 40 upon the bar 15 by the screws 47 and upon the ears 52 by the screws 51, and the platen 11 and platen-shaft 12 are assembled to the carriage-ends 14; that the bending of one or both fingers 50 raises or lowers the free end of the deflector 41 for horizontal alignment thereof with the platen; that the cam-disks 60 may be permanently assembled upon the shaft 25, and the bending of the straps 64 adjusts the slots 65 therein to the two disks, and in this manner the assembled tool-made paper-table may be readjusted by a simple bending after the table is assembled to the carriage; that the paper-deflector is formed from thin sheet-metal, and the straps 64 are made from thicker and stiffer metal and riveted to the table; and that the two springs 53 are tensioned parallel with the path of the paper-table and wholly maintain the paper-table and its paper-deflector in normal paper-holding position.

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 carriage, the combination with a platen-frame, a revoluble platen in said frame, lower feed-rolls engaging against said platen, a feed-roll-release device, a spring for the same, a rear paper-table including a lower apron normally disposed closely adjacent the lower side of said platen, an upper extension to said table, and mountings to permit the table to move to provide an increased gap between said apron and the platen for facilitating the insertion of work-sheets therebetween, of instrumentalities normally responsive to the movements of said feed-roll-release device in one direction only, to move said paper-table away from the platen subsequently to said instrumentalities releasing said feed-rolls, resilient means to return the table, independent of said spring, to its normal position, means associated with said mountings for hinging said upper extension to overlap the table and

form a substantially flush continuation thereof, and stationary means also associated with said mountings for spacing said hinged upper extension from the table, so that freedom of motion of said table is secured.

2. In a typewriting machine having a carriage, the combination with a platen-frame, a revoluble platen in said frame, lower feed-rolls engaging against said platen, a feed-roll-release device including a shaft, a rear paper-table including a lower apron normally disposed closely adjacent the lower side of said platen, and mountings to support and permit the table to move to provide an increased gap between said apron and the platen for facilitating insertion of work-sheets therebetween, of instrumentalities operatively connected to release said device and effective for moving said paper-table after releasing said feed-rolls, said instrumentalities including a rack-and-pinion mechanism connecting the table to said device, said mechanism including a rack-member at each side of said table, and a pinion-member engaged therewith on the feed-roll-release shaft.

3. In a typewriting machine of the class described, a platen-frame, a platen, a rear-paper-table having a forwardly-extending apron and a slidable mounting therefor on said frame for a movement forwardly and downwardly to space said apron away from the platen, means for moving said table ahead including a rock-shaft disposed forwardly from said table, two forwardly-extending straps fastened to said table and arranged with rack-elements, and two pinion-members on said shaft engaging said rack-elements.

4. The structure described in claim 3, characterized by a lost-motion coaction between said rack-elements and said pinion-members, effective for leaving said table idle during a predetermined movement of said rock-shaft, and then moving said table ahead, and two springs effective for moving said table back to normal position.

5. In a typewriting machine of the class described having a slidably mounted downwardly-inclined rear paper-table, a rack-and-pinion mechanism for sliding said table forwardly and downwardly including a forwardly-extending rack-member fastened to said table at each side theerof and having a tooth-element formed therein, a lateral shaft positioned forwardly from said table and adjacent said rack-members, and two pinion-members on said shaft, one positioned for engagement with each of said rack-elements.

6. A typewriting machine having a paper-table, a lateral rotatable shaft, and mechanism for moving said table, including a forwardly-extending bar having a tooth-element formed therein by a lengthwise slot, and a member mounted on said shaft having a notch to receive said element positioned effective for said member to engage with the tooth-element to move said paper-table.

7. In a typewriting machine having a carriage, a platen, feed-rollers therefor and a shaft rockable to release said rollers, the combination of a paper-table supported by the carriage at the rear of the platen and formed with a paper-deflector to partially encompass the platen, means at each end of the carriage to guide the table in a straight line towards the platen and guide the paper-deflector thereof away from the platen for a paper-inserting gap around the platen, springs tensioned parallel with the paper-table at each side thereof, to normally hold the deflector under tension against the platen, and means to force the deflector away from the platen when the feed-rollers are released, said means including an enclosed slot formed in each end of the paper-table, and a disk secured to each end of the rock-shaft, each disk being mutilated to form camming means, operable to rock freely within the slots while the feed-rollers are being released, and then engage the ends of the slots to shift and hold the deflector away from the platen for a paper-insertion.

8. In a typewriting machine, the combination with a carriage having a platen, and a paper-table at the rear of the platen formed with a paper-deflector curved to pass under and up the front of the platen, of means for guiding the paper-table in a straight line towards the platen to direct the deflector thereof away from the platen for a paper-inserting gap around the platen, said guiding means including a pair of slots at each side of the table to receive stationary guide-screws, at least one of the slots at each side of the table being formed in fingers on the paper-table, whereby the bending of the fingers will align the deflector to the platen-surface.

9. A typewriting machine having a slidable paper-table, a lateral rockable shaft journaled in said machine, and mechanism for sliding said table, including a finger on the table formed with a bar, and a disk on said shaft mutilated to form a projection operable to interruptively engage said bar and move the table when the shaft is rocked, the finger including a clearance slot for said projection when the projection is restored in advance of the finger and its bar.

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