July 3, 1934. L. J. MILLER 1,965,295

DUPLICATING MACHINE

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Fig. 1.

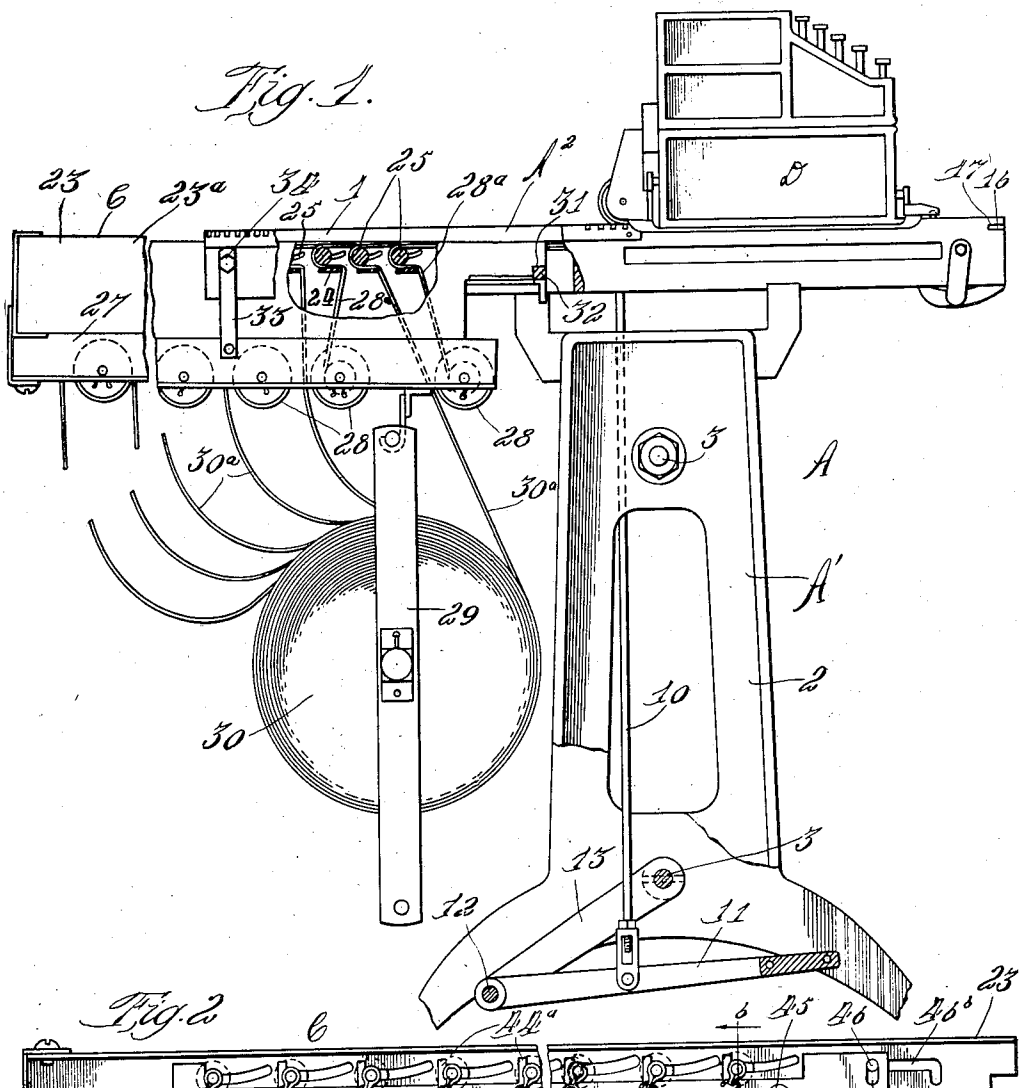
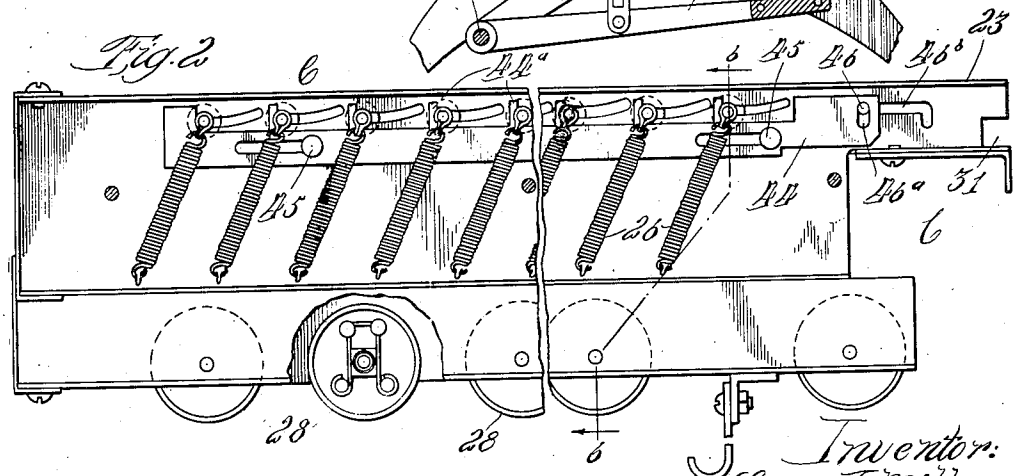


Fig. 2.



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DUPLICATING MACHINE

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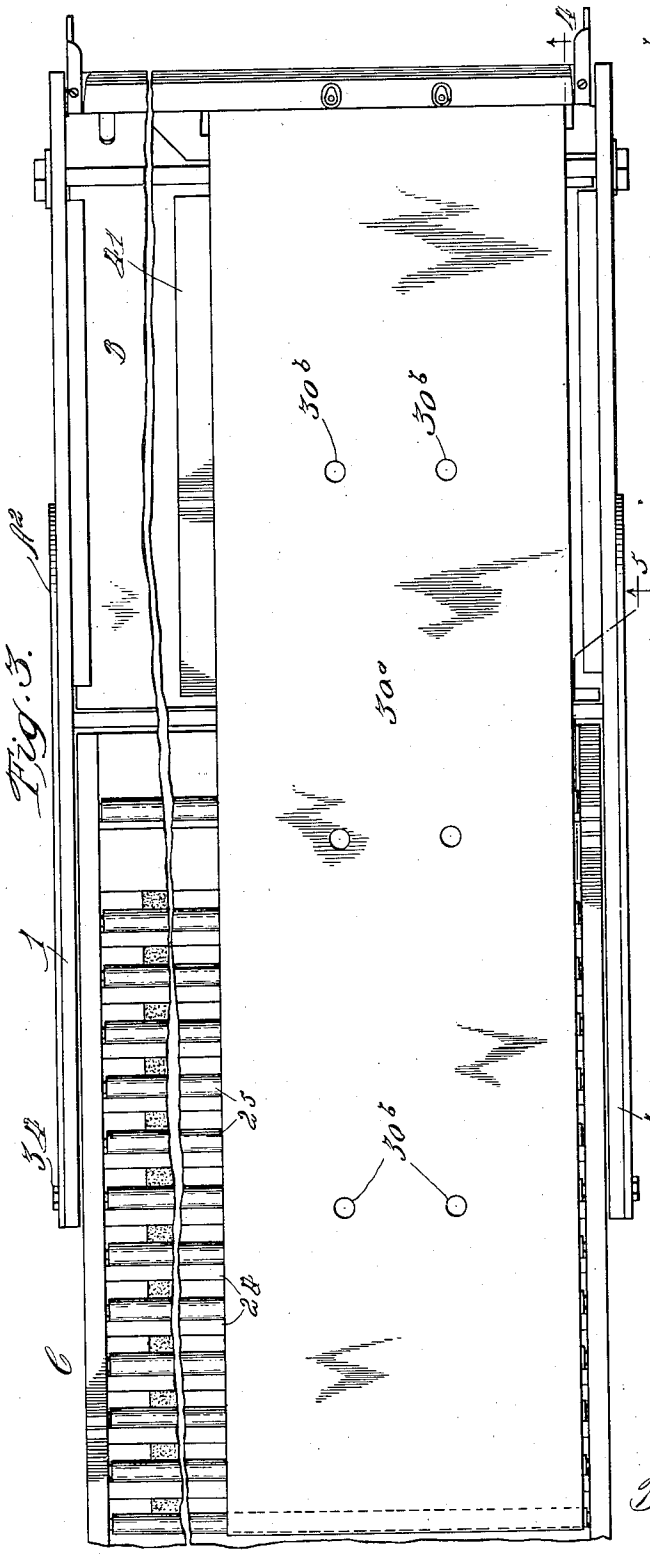


Fig. 3.

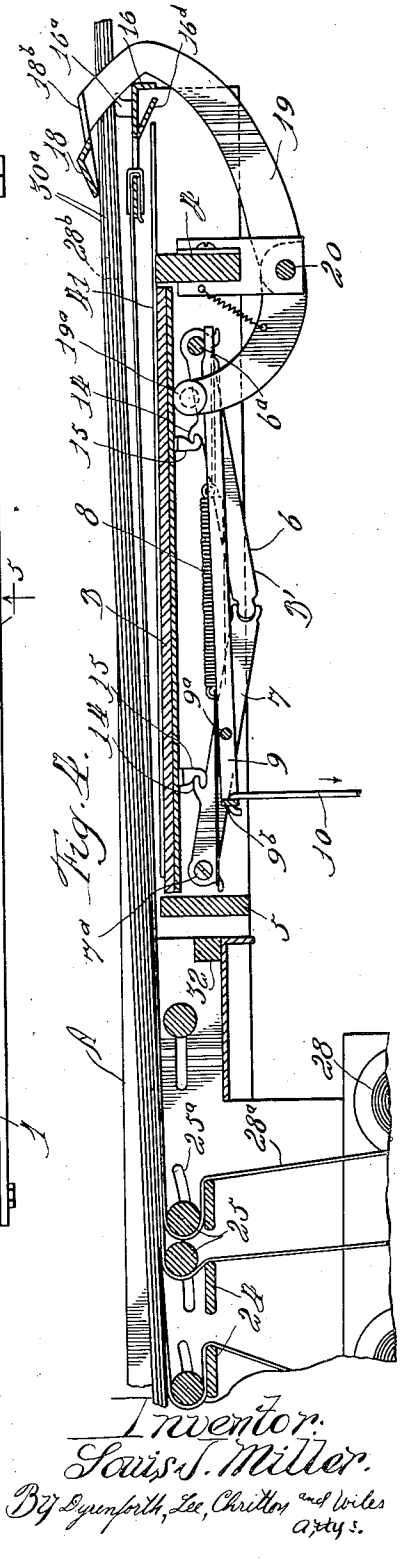


Fig. 4.

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DUPLICATING MACHINE

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Fig. 5.

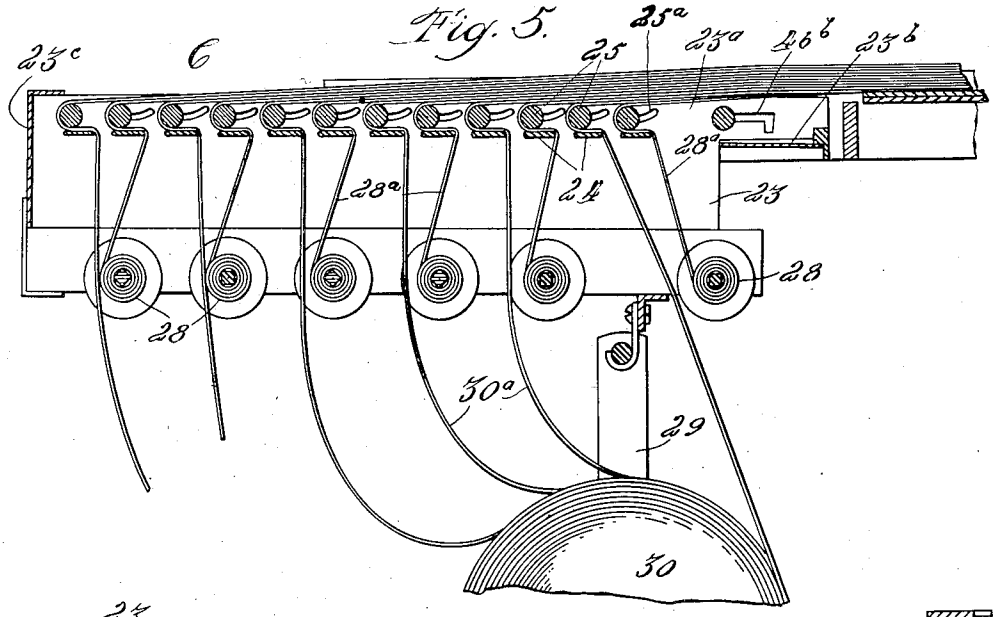
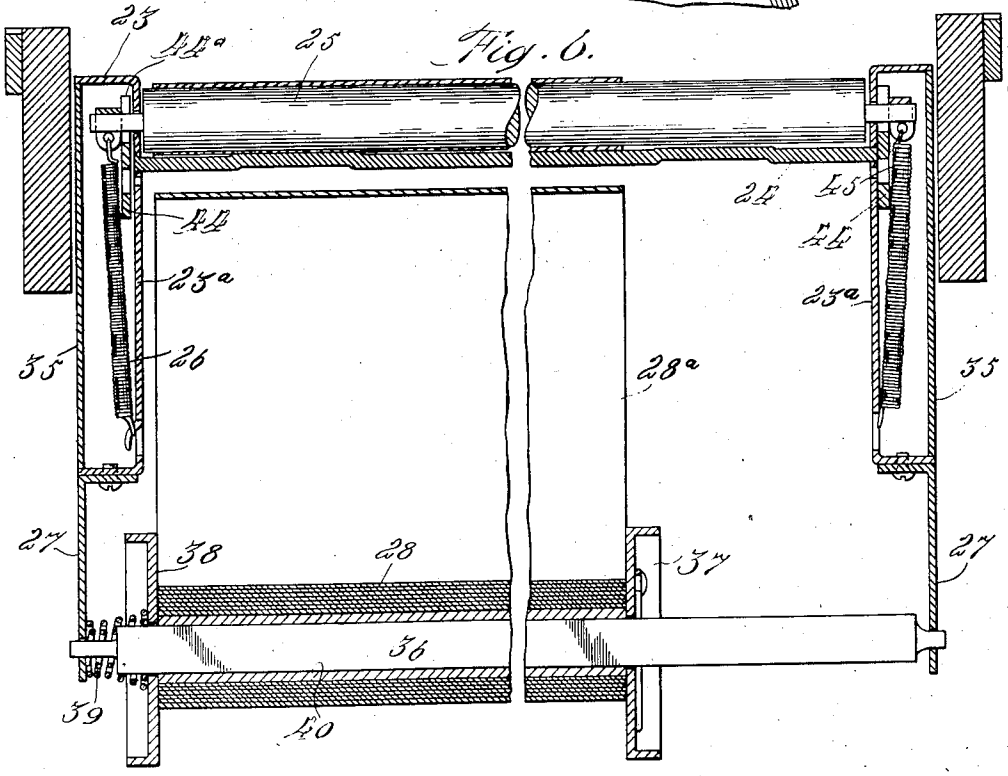


Fig. 6.



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DUPLICATING MACHINE

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Fig. 7.

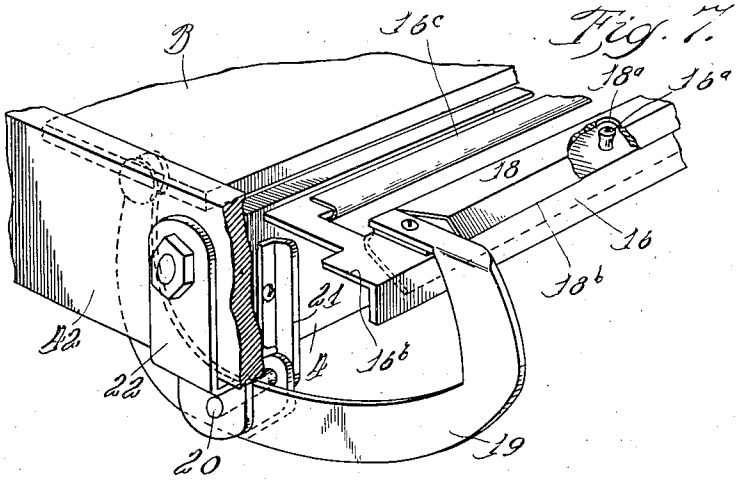


Fig. 8.

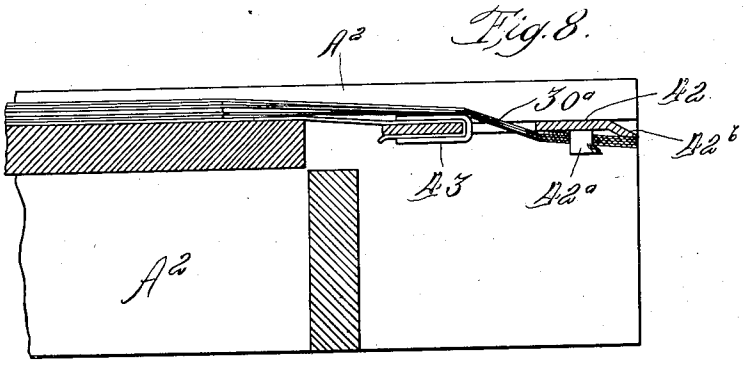
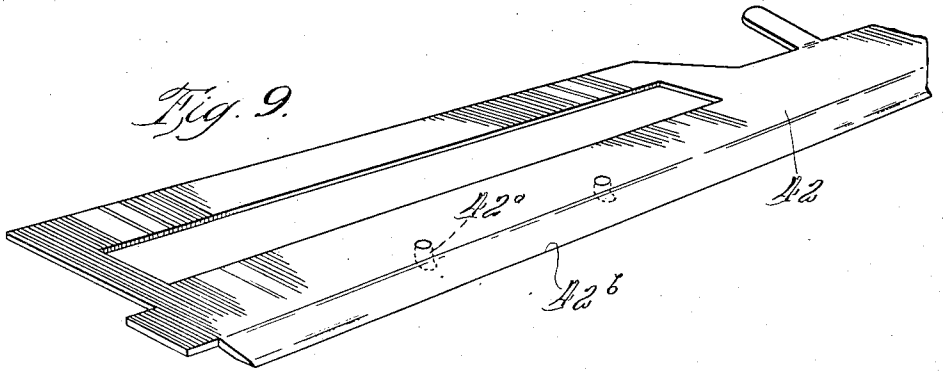


Fig. 9.



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Patented July 3, 1934

1,965,295

UNITED STATES PATENT OFFICE

1,965,295

DUPLICATING MACHINE

Louis J. Miller, Cincinnati, Ohio, assignor to United Autographic Register Co., Chicago, Ill., a corporation of Illinois

Application October 10, 1929, Serial No. 398,715

6 Claims. (Cl. 197—133)

This invention relates particularly to duplicating machines adapted to the purpose of filling in forms on continuous-form stationery.

The invention is more particularly applicable to a machine comprising a bed equipped with a plate-form platen, and a typewriter movably mounted on the bed and adapted to the purpose of filling in the forms.

The primary object is to provide improved web-tensioning means in combination with a series of carbon-rolls from which fresh supplies of carbon-strips may be drawn, as needed.

In accordance with the present invention, the paper webs pass over individual web-tensioning devices; and carbon-rolls are interposed between the paper webs and the carbon strips pass therefrom over individual strip-retracting devices and are interleaved between the paper webs. As often as may be necessary, the carbon strips are drawn forwardly with the paper webs (after a form has been filled in) and both the paper webs and the carbon strips are torn off over a suitable tearing-edge. The hold on all of the strips may then be released and the individual tensioning devices will serve to retract all of the strips a limited distance. Thereafter, the operator may take hold of the paper webs and draw them forwardly and bring a fresh set of register-perforations into engagement with pins or hooks which are provided at the front end of the bed of the machine. This leaves the front ends of the carbon-strips (which are unperforated) some distance in the rear of the hooks which serve as a means for holding the paper webs against the tension exerted by the individual tension devices.

The invention is illustrated in a preferred embodiment in the accompanying drawings, in which—

Fig. 1 is a broken side elevational view of a machine embodying the invention; Fig. 2, a side elevational view of the tensioning mechanism removed from the bed of the machine; Fig. 3, a broken plan view of the machine (typewriter removed); Fig. 4, a broken vertical sectional view taken as indicated at line 4 of Fig. 3; Fig. 5, a broken longitudinal vertical sectional view of the tensioning mechanism taken as indicated at line 5 of Fig. 3; Fig. 6, a broken transverse vertical section taken as indicated at line 6 of Fig. 2; Fig. 7, a broken perspective view illustrating the construction at the front end of the bed of machine, this view showing a web-clamping device which serves also as a tear-off device; Fig. 8, a broken longitudinal vertical section showing a modification at the front end of the bed of the machine, a stationary tear-off edge being provided in this instance; and Fig. 9, a perspective view of the tear-off device shown in Fig. 8.

Referring to Figs. 1–7, A designates a frame comprising a standard A′ and a bed A^2; B, a platen mounted in the front portion of said bed and equipped with actuating mechanism B′; C, web-tensioning mechanism demountably carried between rearwardly extending arms 1 with which the bed A^2 is provided; and D, a typewriter machine mounted on rails which constitute the horizontal bed A^2 of the machine.

The frame A may be of any suitable construction. In the form shown the standard A′ consists of uprights 2 which are connected rigidly together by means of bolts 3.

The platen B is mounted in the bed A^2 between cross-members 4 and 5. The platen is vertically movable. It is carried by mechanism B′ of well-known construction, and is capable of being raised and lowered bodily. The mechanism B′ is shown as comprising levers 6 and 7 which are connected with cross-rods, or pivots, 6^a and 7^a; springs 8 connecting the levers (shown as toggle levers) in elevated position (Fig. 4 shows depressed position); a U-shaped lever 9 having the extremities of its arms bearing beneath the pivot rod 6^a, said arms being joined by a pivot rod 9^a to the levers 7 a short distance from the web 9^b; a connecting rod 10 connected with the web 9^b; and a bolt lever or treadle 11 connected with the rod 10 and supported by a pivot 12 carried by rigid arms 13 secured to the lower bolts 3.

The levers 6 and 7 are equipped with hooks 14 which engage hooks 15 which depend from the platen. The construction and arrangement are such that when the treadle 11 is depressed, the mechanism is moved into the position shown in Fig. 4, and upon release of the treadle the platen rises to the normal position.

The front end of the bed A^2 is equipped with a cross-bar or cross-plate 16, which is provided on its upper side with pins or hooks 16^a which are adapted to engage register-perforations with which the paper-webs are provided. The rails which constitute the bed A^2 are shown provided at the front ends with slots 17 into which are securely fitted the portions 16^b of the cross-plate 16.

Co-acting with the cross-members 16 is a combined clamp and tear-off device 18 which is provided with perforations 18^a which fit loosely over the hooks 16^a and which is provided also with a tear-off edge 18^b. The member 18 is carried

by levers 19 which are supported on pivots 20. The pivots 20 are carried by inner clips 21 attached to the cross-bar 4 and the outer clips 22 attached to the rails of the bed A^2. The levers are of the bent form shown, and are disposed below the cross-bar 4 and the cross-plate 16. The rear ends of the levers are curved upwardly and equipped with rollers 19^a, which bear against the lower side of the platen B. When the platen is depressed, the front ends are drawn upwardly thus lifting the clamping bar 18 to the position shown in Fig. 4. This permits the paper webs to disengage from the hooks 16^a and be drawn forwardly.

The tensioning mechanism C is shown as comprising a demountable auxiliary frame 23 comprising longitudinal members 23^a, a front cross-member 23^b and a rear cross-member 23^c; a series of transverse slats or snubbing-bars 24 connecting the longitudinal members 23^a; a series of shiftable transverse guide-rods 25 overlying the bars 24 and having reduced extremities movable in forwardly and upwardly inclined slots 25^a with which the members 23^a are provided; a series of tension springs 26 connecting the trunnions of the guide-rods 25 with the frame-members 23^a, said springs serving normally to hold the guide-rods 25 in retracted position; a sub-frame or extension 27, depending from the frame-member 23^a; a series of carbon rolls 28 mounted in the sub-frame 27 and having carbon-strips 28^a extending therefrom about alternate tensioning rolls 25; a hanger 29 depending from the sub-frame 27; and a web-supply roll 30 supported in said hanger, from which paper webs 30^a extend about the other alternate tensioning rolls 25 and thence forwardly across the platen.

The auxiliary frame 23 has its front end provided with notches 31 which engage a cross-bar 32 which connects the arms 1; and the auxiliary frame is further supported by links 33 which are attached by cap-screws 34 to the rear end portions of the arms 1.

The members 23^a of the auxiliary frame are shown as channel-form members having outturned flanges. The channels are closed by plates, or strips 35, and thus the members 23^a form housings for the springs 26.

As shown in Fig. 6, each carbon roll 28 comprises a shaft 36 supported in the sub-frame 27; a disk 37 adjustably secured on the shaft 36; an opposed disk 38 movably mounted on the shaft 36 and a spring 39 interposed between the disk 38 and the adjacent member of the sub-frame 27. The spring 39 has an enlarged inner end bearing against the disk 38 while the other end bears against the inner surface of bracket bar 27. The carbon is shown wound upon a tube 40 which is confined between the disks 37 and 38. The disks 37 and 38 in connection with the spring 39 afford a tensioning device for the carbon rolls. Ordinarily the carbon roll remains yieldingly fixed, but may be rotated when the carbon strips are drawn forward over the platen for the purpose of bringing a fresh portion to the strips in the position over the platen.

In Figs. 3 and 4 an independent proof-sheet or tally sheet 41 is shown upon the platen. This sheet may be employed for receiving totals, for example, and may be drawn forwardly a proper distance, as desired.

In the use of the machine, a set of register-perforations 30^b in the paper webs may be brought into engagement with the hooks 16^a. The carbon strips have their front ends located some distance back of the hooks, as indicated at 28^b in Fig. 4. After the adjustment of the webs and carbon strips, the platen B is permitted to rise and the clamp 18 allowed to return into clamping engagement with the cross-member 16. After the form has been filled in by means of the typewriter, the operator depresses the treadle thus lowering the platen and elevating the clamping-member 18. The operator then draws the paper webs forwardly to bring a fresh set over the platen, a fresh set of register-perforations being brought into engagement with the hooks. Pressure upon the treadle is then released and the clamping-member is permitted to return to normal position, after which the operator severs the webs by tearing them over the edge 18^b. When it is desired to renew the supply of carbon over the platen, the operator takes hold of all the strips, draws them forwardly, and effects severance of all the strips. All of the strips are then permitted to be drawn rearwardly by the action of the individual tensioning devices, after which the operator takes hold of the strips of paper and draws them forwardly and brings a fresh set of register-perforations into engagement with the hooks. An alternative procedure is to hold the paper webs and permit only the carbon strips to be retracted by the tensioning devices 25 allocated to the carbon strips.

In the construction shown in Figs. 4 and 7, the cross-plate 16 is shown provided with a member 16^c which is struck upwardly and curved rearwardly and which serves as a housing for the front end of the lowermost carbon-strip (superposed over the proof sheet). Also, the plate 16 is shown provided with a downwardly struck forwardly turned member 16^d which serves as a guide beneath which the proof sheet 41 may be drawn.

In the modification shown in Figs. 8 and 9 the clamping-member 18 is omitted, and a cross-plate 42 is substituted for the cross-plate 16 of the first-described construction. The plate 42 is equipped on its lower side with depending hooks 42^a and the plate is provided at its front edge with a tear-off edge 42^b. In this case, the paper webs 30^a are brought downwardly through a slot in the plate 42 and caused to engage the hooks 42^a. When the paper webs are drawn forwardly to bring a fresh form over the platen, the webs are caused to engage the hooks 42^a, and the operator then tears the webs over the edge 42^b.

In Fig. 8, the lowermost carbon strip is shown secured at its front end to a portion of the plate 42 by means of a clip 43.

Referring to Figs. 2, 5 and 6, slide-bars 44 supported on studs 45 serve to shift the guides 25 forwardly when it is desired to thread the machine. The slides are provided with projections 44^a which engage the spindles of the guides 25. The slides may be drawn forward manually by means of a cross-rod 46 mounted in vertical slots 46^a at the front ends of the bars and movable in L-slots 46^b with which the inner walls of the frame members 23^a are provided. The rod may be depressed into the off-sets of the slots 46^b to lock the sliding device in forward position while the webs are being threaded between the slats 24 and guides 25.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

1. In means of the character set forth: a platen; a frame in which said platen is mounted having arms extending rearwardly from the platen, said frame being equipped near the front end of the platen with pins for engaging register-perforations in paper webs led thereto over said platen; a source of supply for paper webs; carbon holders mounted in said frame between the planes of said arms from which carbon strips are led forwardly between the said webs; and means for automatically retracting the carbons a limited distance and for tensioning across the platen the paper webs which engage said pins.

2. Mechanism as specified in claim 1, in which the carbon holders are in the form of carbon rolls equipped with friction devices serving normally to prevent forward movement of the carbon strips but permitting the carbon strips to be drawn forcibly forward.

3. In mechanism of the character set forth; a platen; a frame in which said platen is mounted having arms extending rearwardly from the platen, said frame being equipped near the front end of said platen with pins for engaging register-perforations in paper webs led thereto over said platen; an auxiliary frame supported between the planes of said arms provided with a series of transverse snubber-bars; a series of forwardly shiftable guide-rolls co-acting with said bars; springs normally holding said guide-rolls in retracted snubbing position; a source of paper-webs supply from which paper webs may be threaded between alternate sets of snubber-bar and guide-roll and then led forward over the platen; and a series of friction-held carbon rolls mounted in said auxiliary frame, corresponding with alternate snubbing and tensioning devices and from which the carbon strips may be threaded between the remaining alternate sets of snubber-bar and guide-roll, whereby automatic rearward shifting of the carbon strips will occur after fresh portions of the carbon strips have been drawn forwardly with the paper-webs and severance effected.

4. Mechanism as specified in claim 3, in which said auxiliary frame is equipped with a hanger for supporting a multiple-web roll, from which the webs are led to alternate tensioning devices, the carbon rolls being disposed between the paths of webs passing from the multiple-web roll to their respective tensioning devices.

5. In mechanism of the character set forth: a frame provided with a bed; a spring-supported vertically movable platen in said bed; manual means for depressing said platen bodily; a web-clamping member co-acting with the front portion of said bed and provided with a tear-off edge; and clamping-bar actuating means actuated directly by said platen.

6. Mechanism as specified in claim 5, in which said clamping-bar actuating means comprises levers pivotally supported on the bed of the machine and having arms engaged directly by said platen.

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