

April 12, 1932.

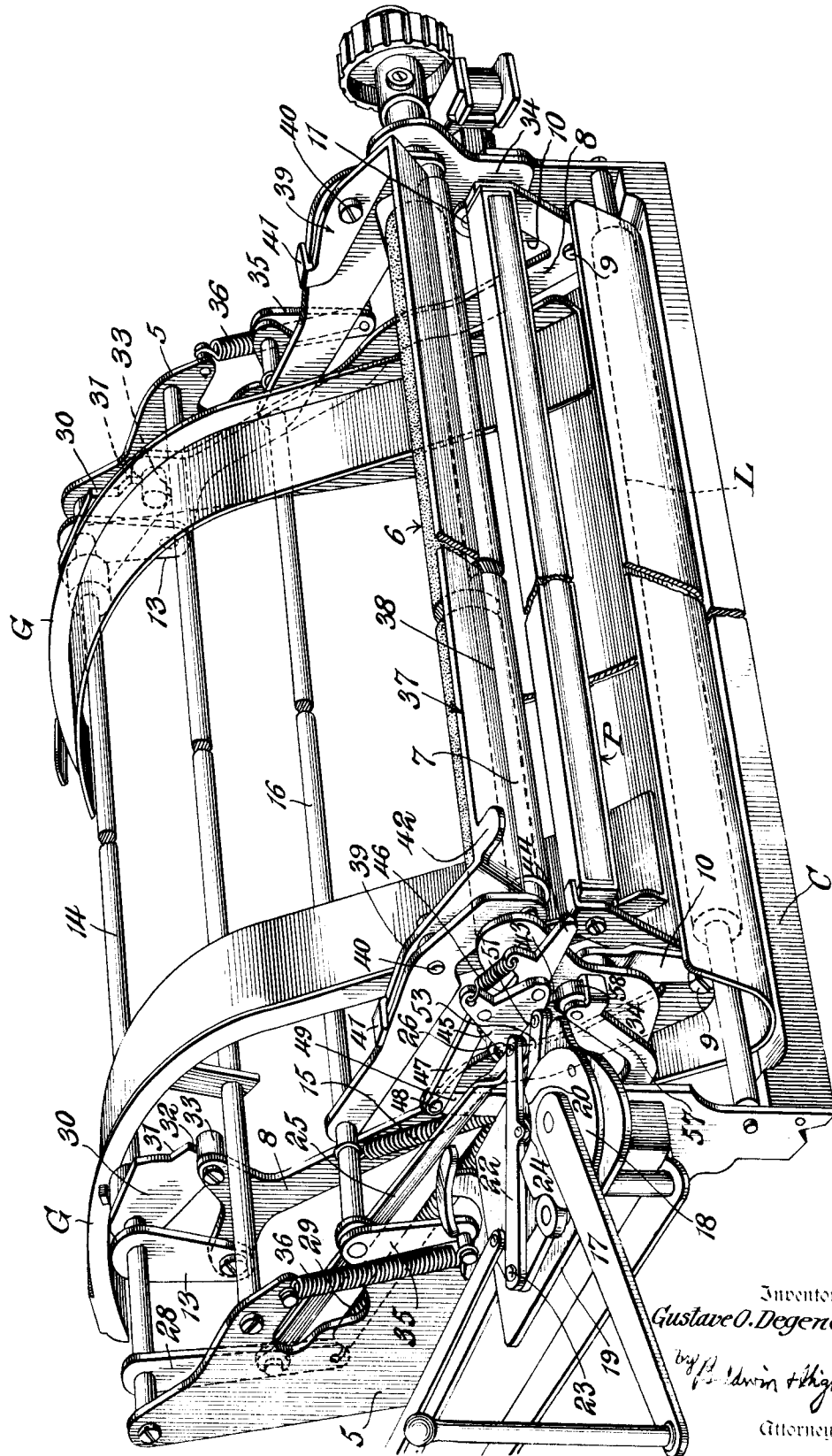
G. O. DEGENER

1,853,670

MANIFOLDING MACHINE

Original Filed May 2, 1929 4 Sheets-Sheet 1

Fig. 1.



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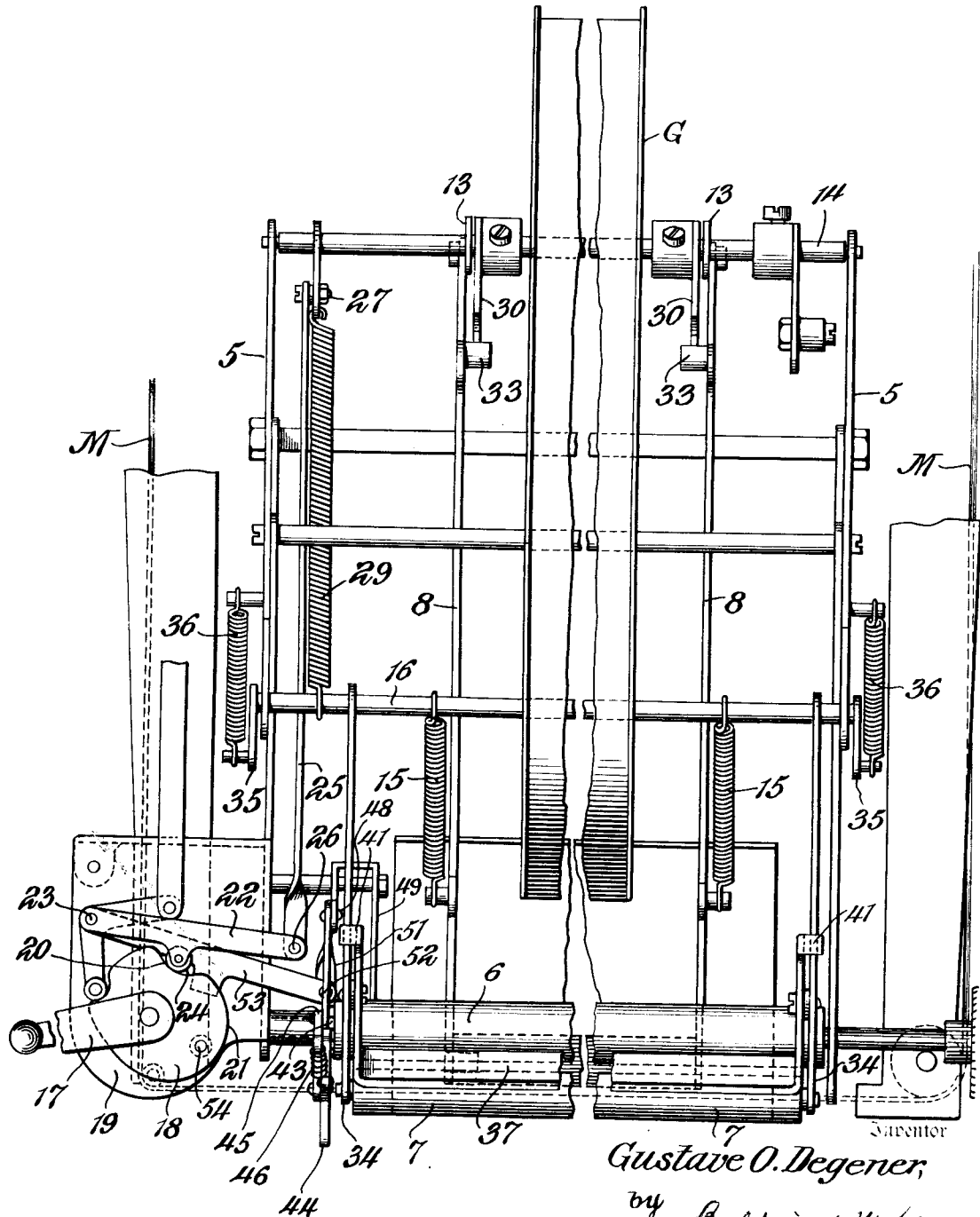
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Fig. 2.



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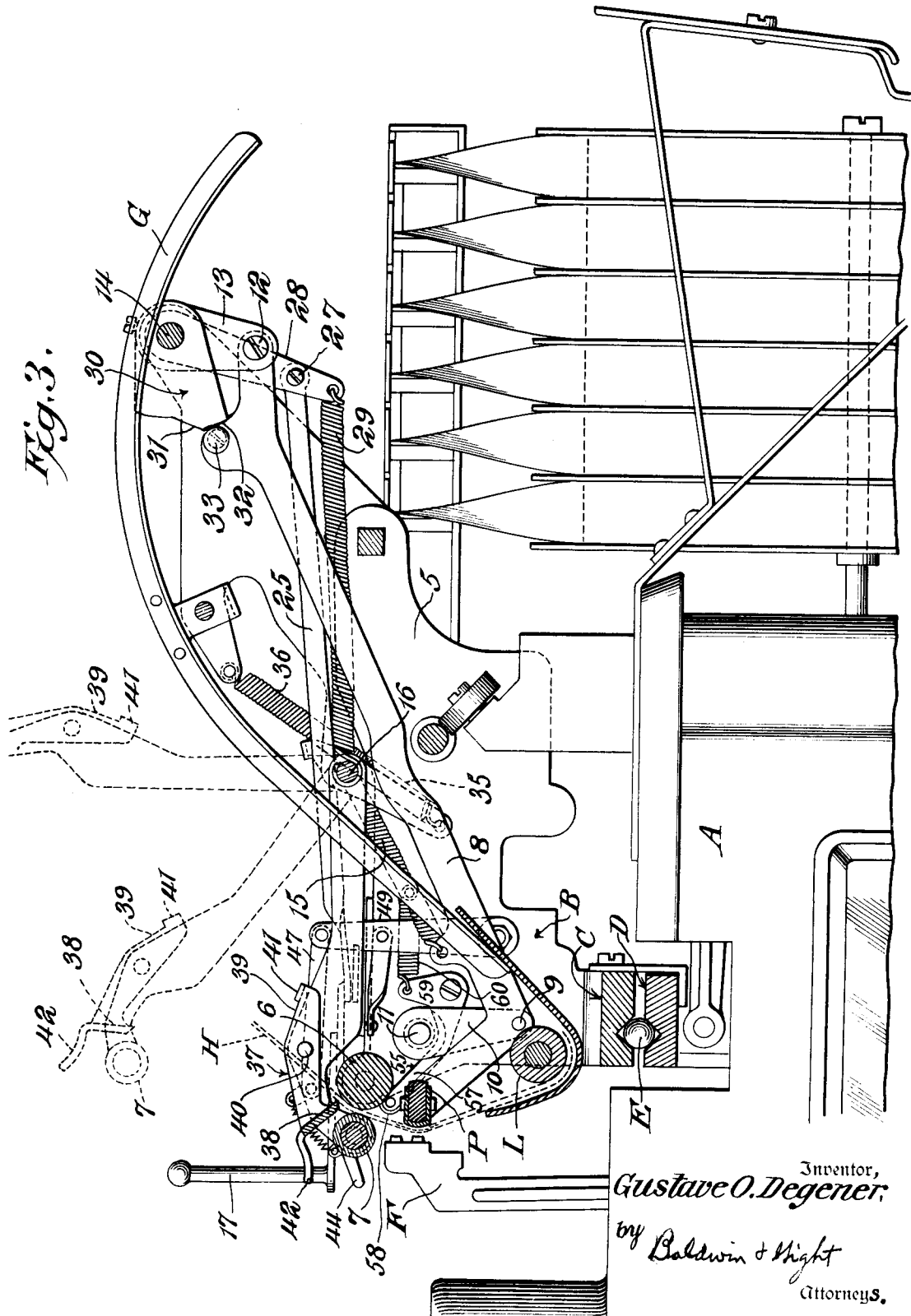
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4 Sheets-Sheet 3



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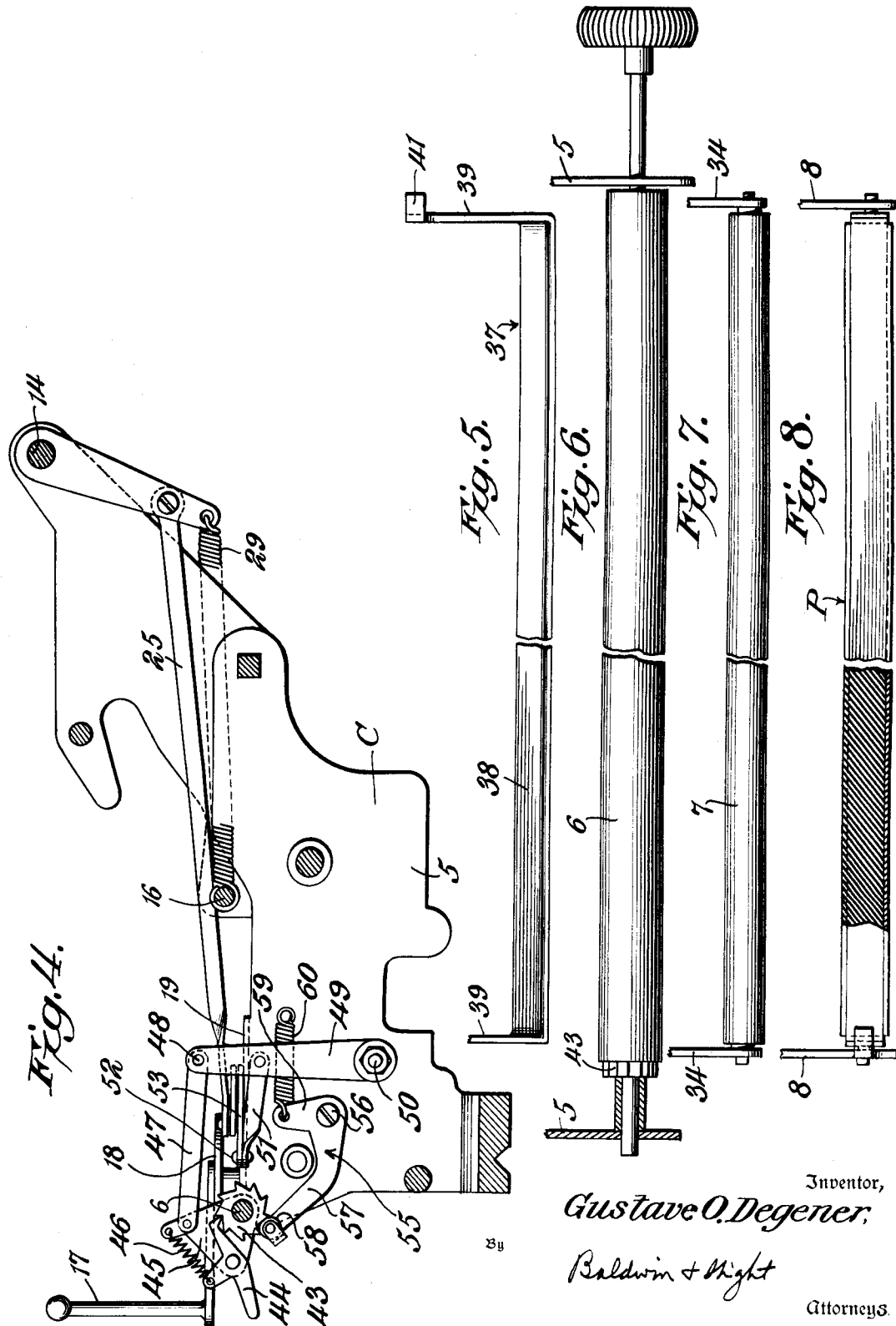
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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MANIFOLDING MACHINE

Original application filed May 2, 1929, Serial No. 359,934. Divided and this application filed May 15, 1930. Serial No. 452,719.

This invention relates to new and useful improvements in manifolding devices which may be readily attached to any standard typewriting machine without changing such machine in any material respect, and embodies certain improvements over the inventions disclosed in my co-pending applications Serial No. 133,437, filed September 3, 1926, and in the divisional application thereof Serial No. 194,135, filed May 25, 1927. This particular application is a division of the parent application Serial No. 359,934, filed May 2, 1929.

The present invention and likewise the inventions of the co-pending applications above noted, is designed for the purpose of writing on continuous billing forms or work sheets which are frequently in lengths of several hundred feet. The inventions embodied in said co-pending applications are adapted to employ such work sheets which include a front original sheet and a plurality of duplicate sheets arranged behind said record sheet. These original and duplicate sheets are provided with transverse lines of perforations which are spaced at uniform distances apart. These original and duplicate sheets are thus divided into connected forms and these forms are provided with printed matter on their front faces. It is desirable to maintain the printed matter of the superposed sheets which constitute each form in exact registration in order that the typewritten matter will with certainty be placed in the proper positions on the carbon sheets.

However, sometimes the outer or front sheet only is ruled or otherwise printed, and there is no printed matter whatever on the duplicate sheets. The sheets are not perforated, and consequently the above described construction which is embodied in my co-pending applications is not particularly adapted for use with such work sheets for the reason that it is unnecessary to maintain said sheets in exact registration.

It is, therefore, among the several objects of the present invention to provide a manifolding device in combination with a typewriting machine which is especially adapted for writing letters and making carbon copies thereof; to provide a knife or straight-edge

by means of which the original and the carbon copies of a given letter may be simultaneously torn off from the supply; to provide a platen element, a guide disposed below the platen element for directing the work sheets upwardly past the platen, a pair of feed rollers disposed above the platen for line spacing the work sheets, and means for bodily moving the platen rearwardly to relieve the normal tight contact relation between the platen and the work sheets and to effect a line spacing movement to the feed rollers while the platen is in its relieved position.

In the accompanying drawings:

Figure 1 is a perspective view of the device embodying my invention,

Figure 2 is a top plan view thereof,

Figure 3 is a vertical sectional view showing the device applied to a typewriting machine,

Figure 4 is a detailed vertical sectional view thereof,

Figure 5 is a plan view of the knife,

Figure 6 is a plan view of the feed roll,

Figure 7 is a plan view of the pressure roll, and

Figure 8 is a plan view of the platen.

As previously stated the invention may be employed in various types of typewriting machines and there has accordingly been illustrated only enough of the usual typewriting machine to show the position of my invention with relation thereto.

In the drawings there is shown a main frame A, a carriage B having a rail C adapted to travel on the main rail D mounted on the main frame through the medium of ball bearings E. The typewriting machine includes the usual type bars F. A paper table G is supported on the carriage and paper webs or work sheets H are fed thereover to the platen of the machine. Between the work sheets H are fed carbon strips M.

The carriage B is provided with side plates 5, 5 and fixed to the forward ends of the plates is a lower guide or roller L for guiding the work sheets H upwardly past a platen P which is movably supported on the carriage. The work sheets H pass upwardly from the

platen through a pair of feed rolls comprising an intermittently actuated feed roll 6 and a cooperating pressure roll 7.

The platen P is connected at its ends to rearwardly extending links or supports 8, 8, and the front ends of the links 8 are pivotally connected as at 9 to supporting links or hangers 10 which are in turn pivotally supported on studs 11, 11 fixed to the carriage side plates 5, 5. The rear ends of the links 8 are pivotally connected as at 12 to rock arms 13 fixed to a transversely disposed rock shaft 14 journaled in the side plates 5, 5 of the carriage. Springs 15 are associated with the respective links 8 to yieldably retain the platen P in its rearmost position of movement, that is, in a position in which the platen is relieved of its normal tight contact relation with the work sheets. The forward end of each spring 15 is connected to the associated link 8 and the rear end of each spring is connected to a rock shaft 16 which is connected to the side plates 5 of the carriage. Thus when the platen is in its rearmost position, the work sheets will be line spaced and this is particularly advantageous when making one or more copies of the original work sheet for the reason that by moving the platen bodily and thereby relieving the tight contact relation between the work sheets and the platen at the time of the line spacing operation, the carbon strips which are interleaved with the work sheets will be freed and consequently the work sheets may be readily line spaced without dragging the carbon strips and without blurring the work sheets. The mechanism for feeding such carbon strips is described in my co-pending applications referred to above.

In order to move the platen P forwardly to engage the work sheets, I have provided means for moving the platen against the tension of the springs 15 and also means for locking the platen in its forward or printing position. To this end, a manually operable controlling lever 17 is fixed to a horizontally disposed cam 18 which is pivoted to rotate on a plate 19 extending laterally from one of the side plates 5. The cam 18 is provided with a peripheral depression or eccentric portion 20 and with a concentric portion 21. A lever 22 is pivoted as at 23 upon the plate 19 and carries a cam roller 24 which engages the periphery of the cam 18. A link 25 is pivotally connected at its front end as at 26 to the free end of the lever 22 and at its rear end as at 27 to the lower end of a rock arm 28 fixed to the rock shaft 14. A spring 29 has its rear end connected to the rock arm 28 and its forward end connected to the rock shaft 16. The spring 29 normally urges the rock arm 28 forwardly and consequently the roller 24 is yieldably held in engagement with the periphery of the cam 18. Adjustably fixed to the rock shaft 14 are cams 30, 30 of identical construction. These cams extend forwardly of the

rock shaft 14 and the forward ends of each cam is formed with an eccentric portion 31 and a concentric portion 32, said portions merging into each other. The front edges of the cams 30 engage eccentric shoulders or stop pins 33, 33 fixed to the respective links 8 and having sliding contact therewith. Thus when the control lever 17 is swung to the right as viewed in Figure 2 the eccentric portion 20 of the cam will engage the roller 24 and thereby swing the lever 22 rearwardly. This rearward movement of the lever 22 will move the link 25 rearwardly against the tension of the spring 29 and thereby rock the shaft 14 in a anti-clockwise direction. When the platen P is in its normal or printing position, the concentric portions 32 of the cams 30 are in engagement with the shoulders or pins 33 to lock the platen in its printing position and against the tension of the springs 15. Thus when the control lever 17 is moved to the right, the cams 30 will be swung downwardly thereby moving the concentric portions 32 of said cams out of engagement with the shoulders or stop pins 33 and moving the eccentric portions 31 of said cams into engagement with said shoulders, thereby permitting the springs 15 to automatically return the platen P to its rearmost or non-printing position.

It will be observed that when the control lever 17 is returned to its normal position, the cams 30 will be also returned to their normal positions, thereby returning the platen P to its printing position and locking the platen against rearward movement.

The pressure roll 7 is an idle roll and is preferably formed of metal. This roll is located in front of the feed roll 6 which is preferably formed of rubber. The pressure roll 7 is journaled in arms 34, 34 which extend rearwardly and are pivotally connected at their rear ends to the shaft 16. Fixed to each end of the rock shaft 16 is an arm 35, and a spring 36 is connected at one end to the associated arm 35 and at the other end to the side plate 5 of the carriage. A knife 37 includes a straightedge or cutting blade 38, and to the ends of this blade are fixed rearwardly extending arms 39, 39 which are pivoted intermediate their ends as at 40, 40 to the arms 34, 34. The rear ends of the arms 39 are provided with laterally extending stops 41, 41 for engaging the upper edges of the arms 34 to thereby limit the upward swinging movements of the blade 38 relative to said arms 34. The knife 37 is pivoted so that the cutting edge of the blade 38 is adapted to cooperate with the feed rolls 6 when it is desired to tear off the lead-in ends of the work sheets. A finger piece 42 extends forwardly from the knife 38 and is employed whenever it is desired to swing the knife and the arms 34 upwardly against the tensions of the springs 36 to the dotted line position shown in Figure 3. In this position of the

parts the springs 36, having been moved across the axis of the rock shaft 16, will hold the arms 34, 34 in their operative or inoperative position so as to permit the operator to withdraw his hand therefrom whenever it is desired or to thread the lead-in ends of the work sheets between the feed rolls 6.

In order to impart a line spacing movement to the feed rolls 6 and thereby feed the work sheets after the platen has been moved rearwardly, I provide a ratchet wheel 43 on the left hand end of said roller 6, as shown in Figure 4. A pawl 44 is pivotally mounted on an arm 45 which is fulcrumed on the axis of the feed roller. A spring 46 is connected to the pawl 44 and to the arm 45 for yieldably urging said pawl into engagement with the teeth on the ratchet wheel 43. A rearwardly extending link 47 is pivotally connected at its forward end to the arm 45 and the rear end of this link is pivotally connected as at 48 to the upper end of a vertically extending arm 49 which is fulcrumed as at 50 to the adjacent side plate 5 of the carriage frame. A link 51 is pivotally connected at its rear end to the lever 49 and at its front end as at 52 to the free end of a lever 53 which is pivoted at its other end to the pivot 23 carried by the plate 19. The lever 53 is adapted to be engaged by a roller 54 fixed to the cam 18 when the manually operable lever 17 is moved to the right. The cam 18 and the levers 22 and 52 are so timed that the lever 22 is first actuated to bodily move the platen rearwardly, and the lever 53 is subsequently actuated to effect a line spacing operation to the feed roll 6.

A spring pressed retaining device is employed to retain the feed roll 6 against overthrow. This device comprises a lever 55 fulcrumed at its angle as at 56 to the adjacent side plate 5. One arm 57 is provided at its end with a roller 58 which rides on the teeth of the ratchet wheel 43. The other arm 59 of said lever is connected to one end of a coil spring 60, the other end of the spring being fixed to the associated side plate 5. Thus the roller 58 is spring held in engagement with the ratchet teeth of the ratchet wheel 43 and overthrow of said roll 6 is thereby prevented.

In operation a roll of work sheets consisting of an original sheet and one or more duplicate sheets, is disposed in rear of the machine and the lead-in ends of these work sheets are fed over the table G, thence under the lower guide roll L, thence upwardly past the platen P, and the free ends are disposed between the feed rolls 6 and 7. In order to position ends or lead-in ends between the rolls 6 and 7, the front or idle roll 7 is swung upwardly to the dotted line position shown in Figure 3. This roll is held in its abnormal or non-feeding position by the springs 36. After the lead-in ends have been posi-

tioned in front of said roll 6, the idle roll 7 is then returned to its normal or feeding position, the free ends of the work sheets being disposed above the cutting edge 38 of the knife 37. These free ends are then severed by pulling the same against the knife edge and the machine is then in readiness for operation. The operator then writes a line of printed matter and at the conclusion thereof the manually operable lever 17 is moved to the right as viewed in Figure 2. This movement of the lever causes the cam 18 to swing the lever 22 rearwardly and through the medium of the link 25 the cams 30, 30 are swung downwardly, thus permitting the springs 15, 15 to move the platen L bodily rearwardly for the purpose of relieving the normal tight contact relation between the work sheets and the platen. Upon continued movement of the lever 17 to the right, the roller 54 on the cam 18 engages the lever 53 and effects a line spacing movement to the feed roll 6. Upon continued pressure on the lever 17 toward the right by the operator the carriage C will be moved to the right for the purpose of positioning the work sheets for the next line to be printed. The lever 17 is then returned to its initial position and as a result the cams 30, 30 will be swung upwardly and by reason of their engagement with the stop shoulders 33, 33, the links 8 will be swung forwardly and will thereby carry or move the platen P forwardly to its initial or printing position and in tight contact with the work sheets.

I claim:—

1. In a manifolding device, a platen in front of which work sheets are moved and against which the sheets are nominally disposed in relatively tight contact relation, two cooperating line spacing rollers disposed above the platen and between which the work sheets are fed after leaving the platen, and means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and for effecting a line spacing movement to said rollers while said tight contact relation is relieved.

2. In a manifolding device, a platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, two cooperating line spacing rollers disposed above the platen and between which the work sheets are fed, a guide for the work sheets disposed below the platen, and means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and for effecting a line spacing movement to said rollers while said tight contact relation is relieved.

3. In a manifolding device, a platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, two cooperating line spacing rollers disposed

above the platen and between which the work sheets are fed after leaving the platen, means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and for effecting a line spacing movement to said rollers while said tight contact relation is relieved, and means for movably supporting one of said rollers whereby the same may be moved in a direction away from the platen to permit insertion of the work sheets between said rollers.

4. In a manifolding device, a platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, two cooperating line spacing rollers disposed above the platen and between which the work sheets are fed after leaving the platen, means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and for effecting a line spacing movement to said rollers while said tight contact relation is relieved, and a pivoted bail for movably supporting one of said rollers whereby the same may be swung in a direction away from the platen to permit insertion of the work sheets between said rollers.

5. In a manifolding device, a platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, two cooperating line spacing rollers disposed above the platen and between which the work sheets are fed after leaving the platen, means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and for effecting a line spacing movement to said rollers while said tight contact relation is relieved, a pivoted bail for movably supporting one of said rollers whereby the same may be swung in a direction away from the platen to permit insertion of the work sheets between said rollers, and a cut-off knife for the work sheets mounted on the bail and above the roller carried thereby.

6. In a manifolding device, a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, two cooperating line spacing rollers disposed above the platen and between which the work sheets are fed after leaving the platen, and means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and for effecting a line spacing movement to said rollers while said tight contact relation is relieved.

7. In a manifolding device, a platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, two cooperating line spacing rollers disposed above the platen and between which the work sheets are fed after leaving the platen, the

rear roller being stationary and the front roller being movable in a direction away from the platen to permit insertion of work sheets between said rollers, and means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and for effecting a line spacing movement to said rollers while said tight contact relation is relieved.

8. In a manifolding device, a platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, two cooperating line spacing rollers disposed above the platen and between which the work sheets are fed after leaving the platen, the rear roller being stationary and the front roller being movable in a direction away from the platen to permit insertion of work sheets between said rollers, means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and for effecting a line spacing movement to said rollers while said tight contact relation is relieved, and a cut-off knife for the work sheets movable away from the platen with the front roller.

9. In a front strike typewriter, the combination with a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, of a lower guide disposed below the platen and around which work sheets are fed upwardly past the platen, a pair of normally cooperating feed rolls for the work sheets disposed above the platen, and means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and effecting line spacing movements to one of the feed rolls only.

10. In a front strike typewriter, the combination with a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, of a lower guide disposed below the platen and around which work sheets are fed upwardly past the platen, a pair of normally cooperating feed rolls for the work sheets disposed above the platen, means for moving the platen rearwardly relative to the work sheets to relieve said normal tight contact relation and effecting line spacing movements to one of the feed rolls only, and means for supporting the other roll for movements away from the first roll to an inoperative non-feeding position.

11. In a front strike typewriter, the combination with a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, of a lower guide disposed below the platen and around which work sheets are fed upwardly past the platen, a pair of normally cooperating

feed rolls for the work sheets disposed above the platen, means for moving the platen rearwardly relatively to the work sheets to relieve said normal tight contact relation and effecting line spacing movements to one of the feed rolls only, and severing means for the work sheets disposed above the rolls.

12. In a front strike typewriter, the combination with a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, of a lower guide disposed below the platen and around which work sheets are fed upwardly past the platen, a pair of normally cooperating feed rolls for the work sheets disposed above the platen, means for moving the platen rearwardly relatively to the work sheets to relieve said normal tight contact relation and effecting line spacing movements to one of the feed rolls only, means for supporting the other roll for movements away from the first roll to an inoperative non-feeding position, and a knife for the work sheets disposed above the rolls and movable with the second roll and having its cutting edge located intermediate the axes of the rolls.

13. In a front strike typewriter, the combination with a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, of a lower guide disposed below the platen and around which work sheets are fed upwardly past the platen, a pair of feed rolls for the work sheets disposed above the platen and arranged one in front of the other, means for moving the platen rearwardly relatively to the work sheets to relieve said normal tight contact relation and effecting line spacing movements to the rear roll only, and means for supporting the front roll for upward movements away from the rear roll.

14. In a front strike typewriter, the combination with a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, of a lower guide disposed below the platen and around which work sheets are fed upwardly past the platen, a pair of feed rolls for the work sheets disposed above the platen and arranged one in front of the other, means for moving the platen rearwardly relatively to the work sheets to relieve said normal tight contact relation and effecting line spacing movements to the rear roll only, and an upwardly swingable bail for supporting the front roll.

15. In a front strike typewriter, the combination with a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, of a lower guide disposed below the platen and around which work sheets are fed upwardly past

the platen, a pair of normally cooperating feed rolls for the work sheets disposed above the platen, means for moving the platen rearwardly relatively to the work sheets to relieve said normal tight contact relation and effecting line spacing movements to one of the feed rolls only, means for supporting the other roll for movements away from the first roll to an inoperative non-feeding position, and a spring for retaining the movable roll in either its normal or moved position.

16. In a front strike typewriter, the combination with a non-rotatable platen in front of which work sheets are moved and against which the sheets are normally disposed in relatively tight contact relation, of a lower guide disposed below the platen and around which work sheets are fed upwardly past the platen, a pair of feed rolls for the work sheets disposed above the platen and arranged one in front of the other, means for moving the platen rearwardly relatively to the work sheets to relieve said normal tight contact relation and effecting line spacing movements to the rear roll only, an upwardly swingable bail for supporting the front roll, and a spring for retaining the movable roll in either its normal or moved position.

In testimony whereof, I have hereunto subscribed my name.

GUSTAVE O. DEGENER.