April 12, 1932. G. O. DEGENER 1,853,761

MANIFOLDING DEVICE

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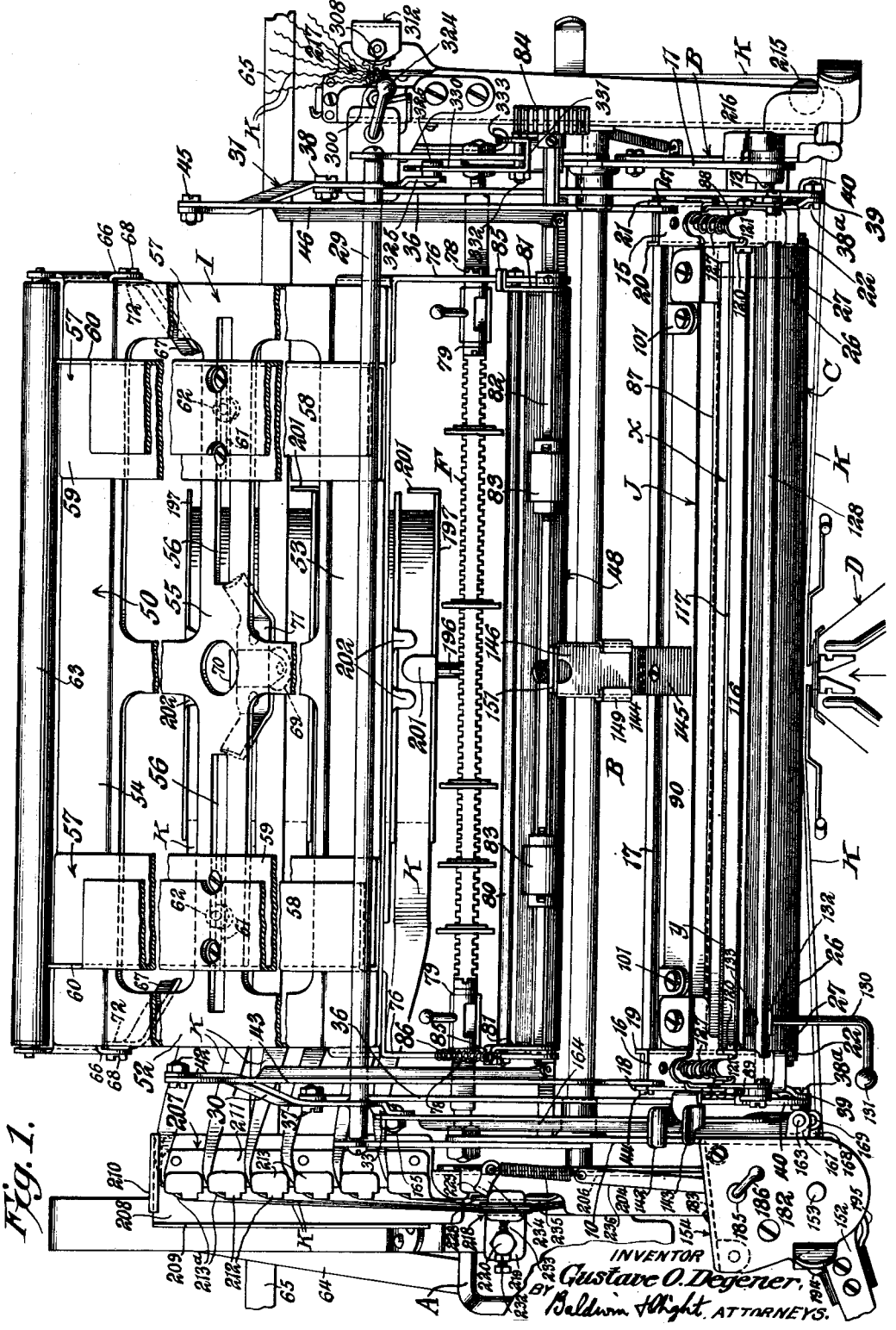

Fig. 1.

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MANIFOLDING DEVICE

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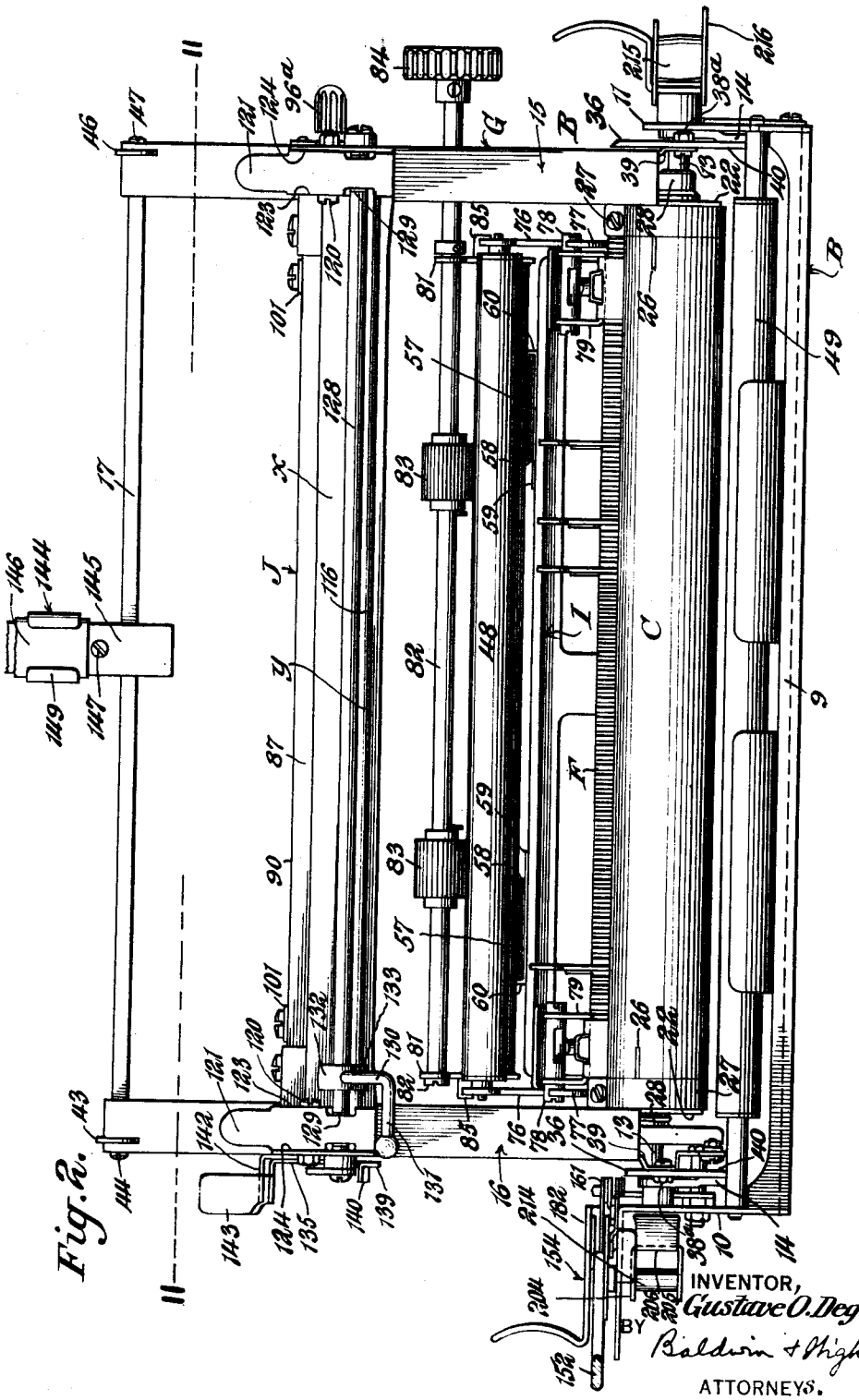

Fig. 2.

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MANIFOLDING DEVICE

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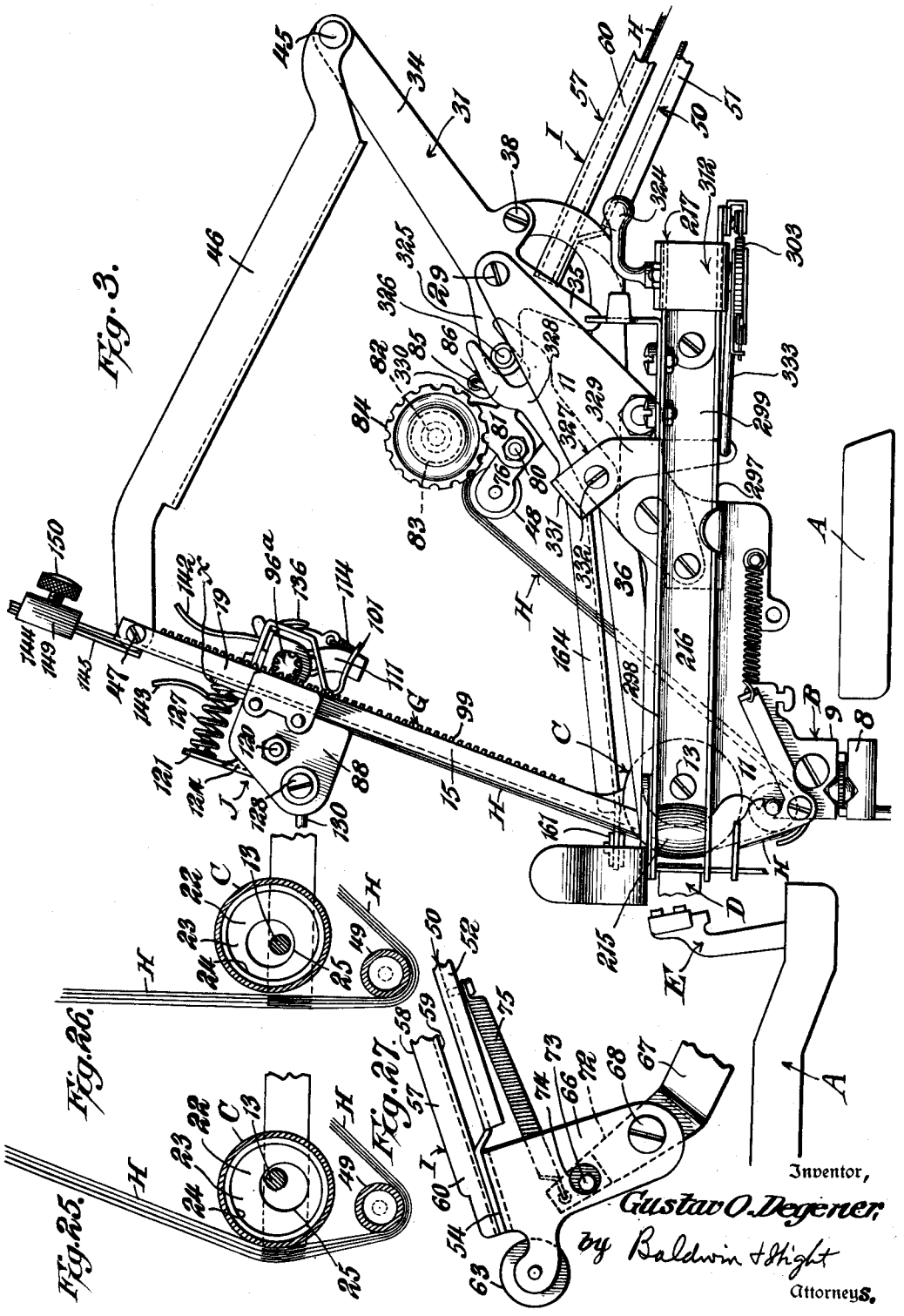

Fig. 3.

Fig. 26.

Fig. 25.

Fig. 27.

Inventor,
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MANIFOLDING DEVICE

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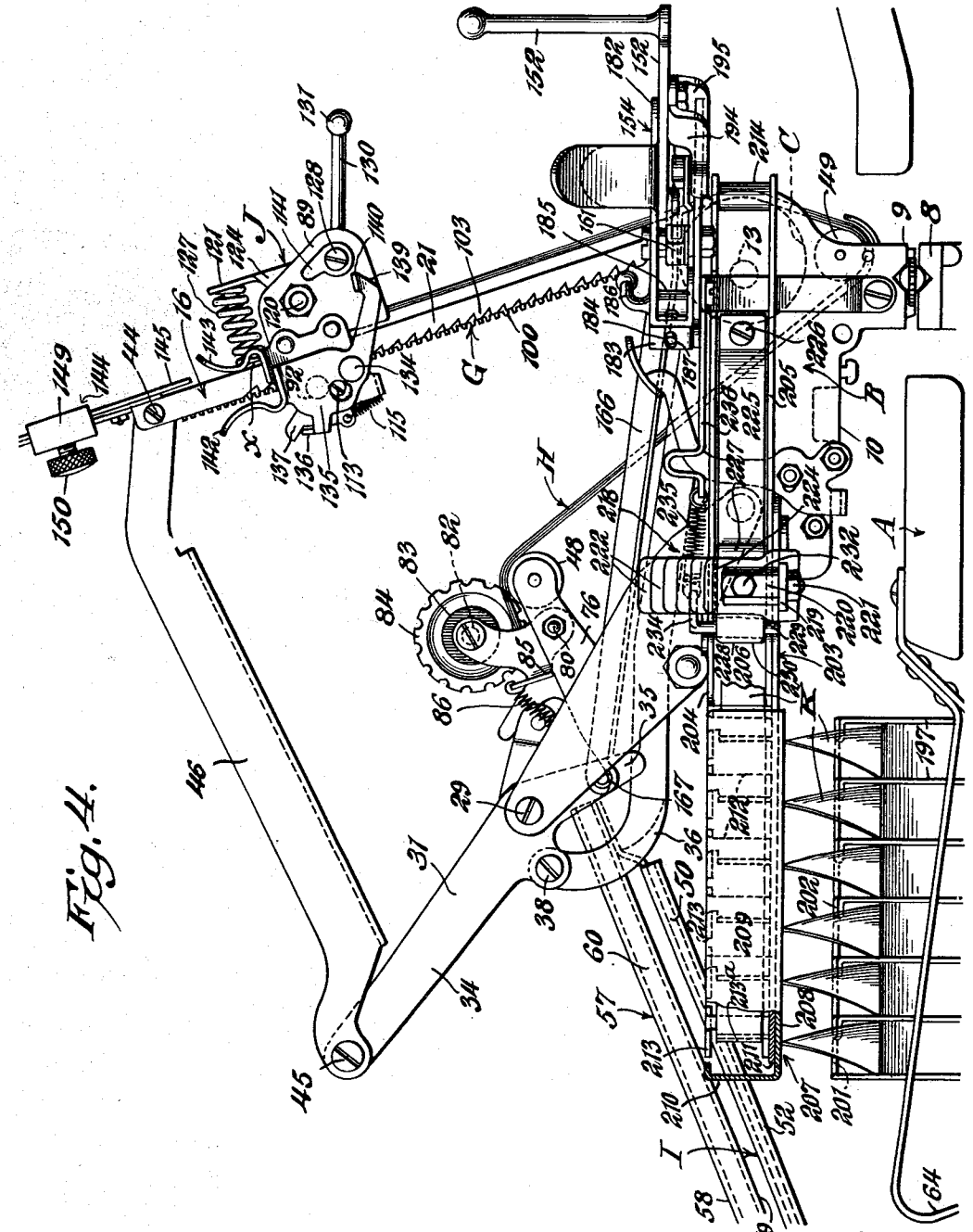

Fig. 4.

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MANIFOLDING DEVICE

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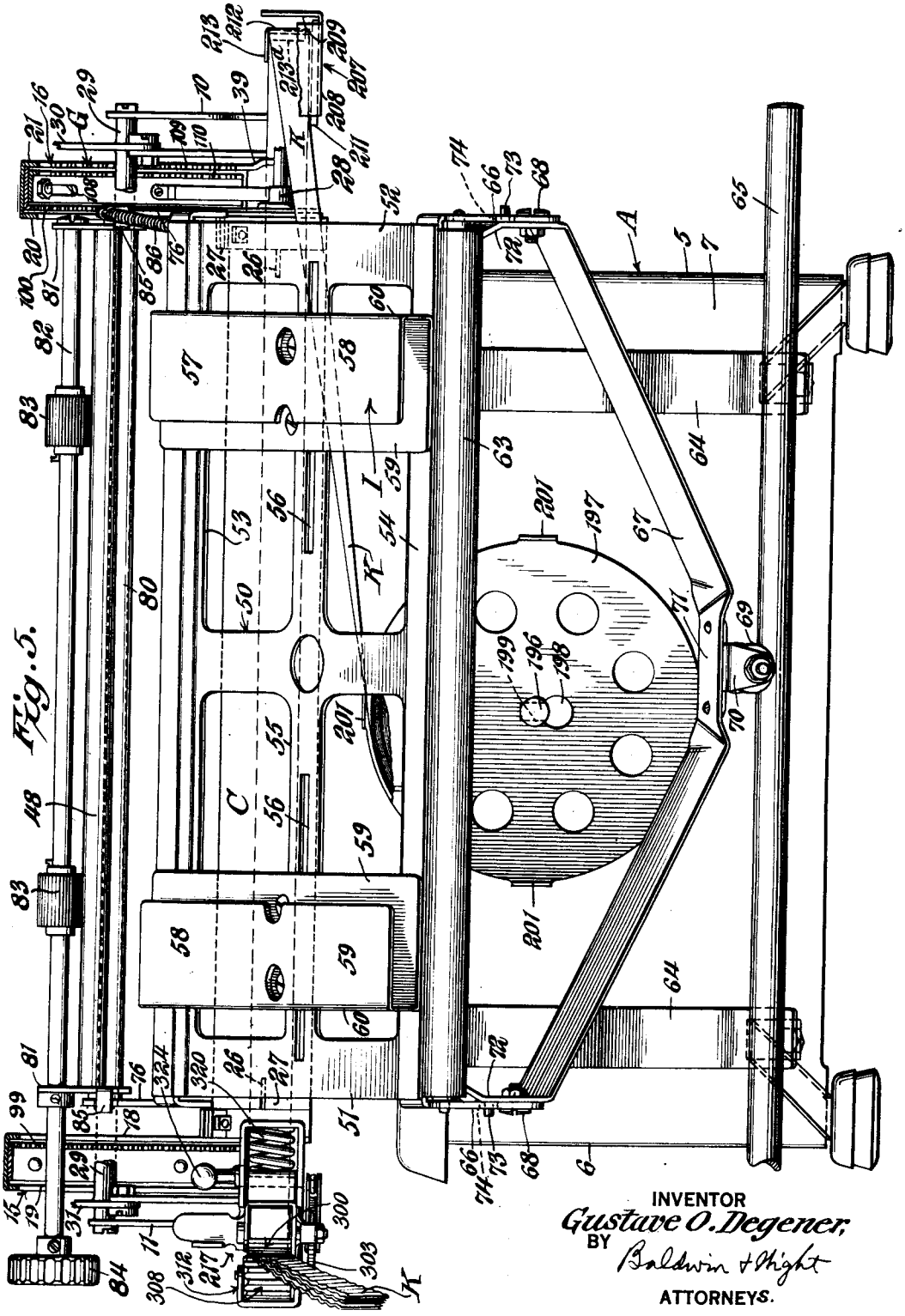

Fig. 5.

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MANIFOLDING DEVICE

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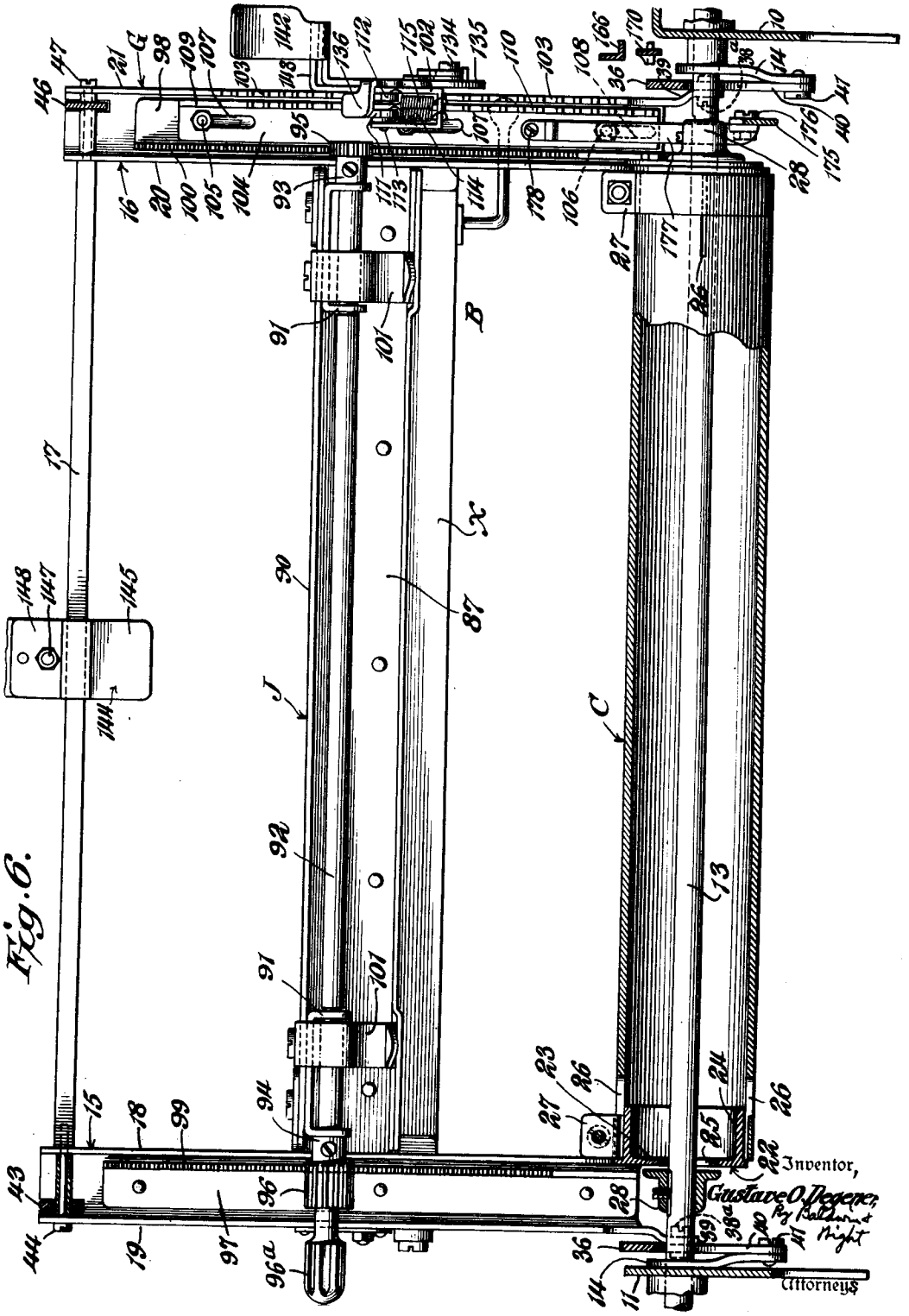

Fig. 6.

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MANIFOLDING DEVICE

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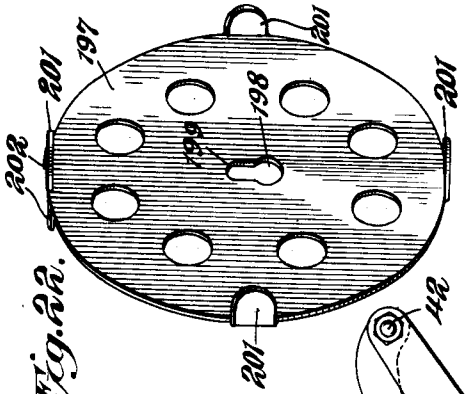

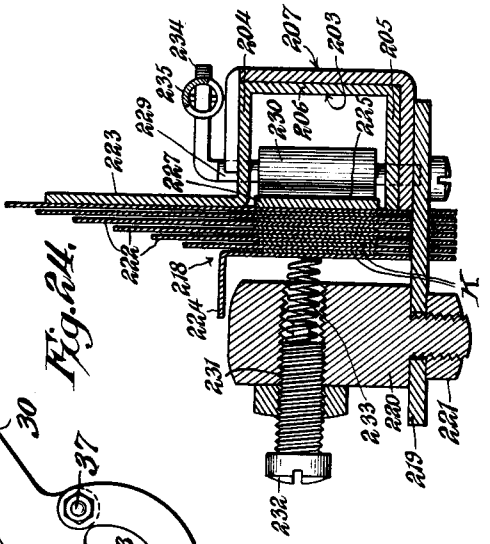

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Fig. 9.

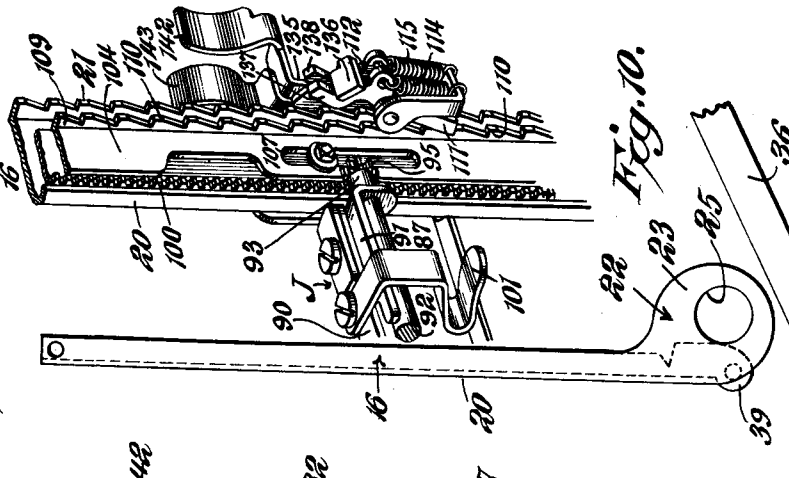


Fig. 10.

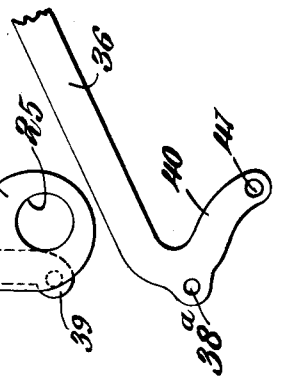
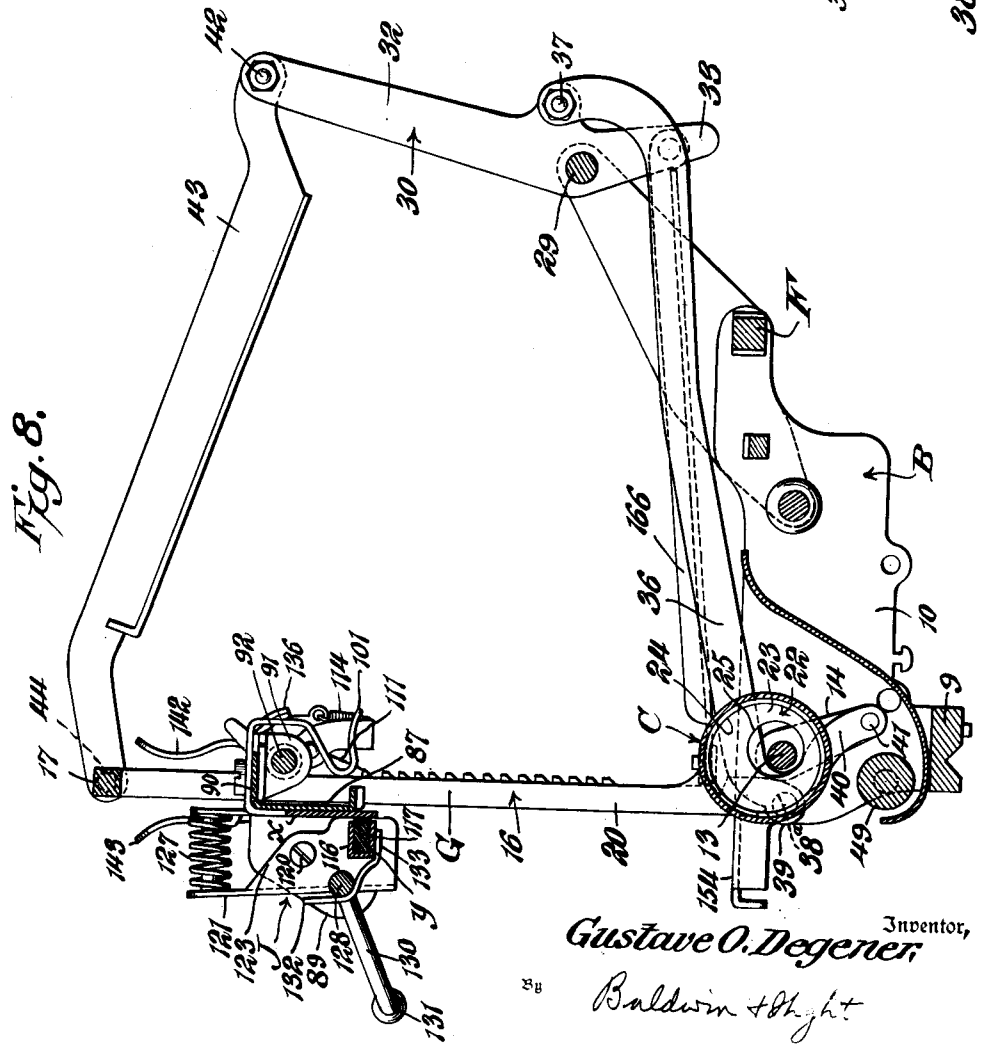


Fig. 8.



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MANIFOLDING DEVICE

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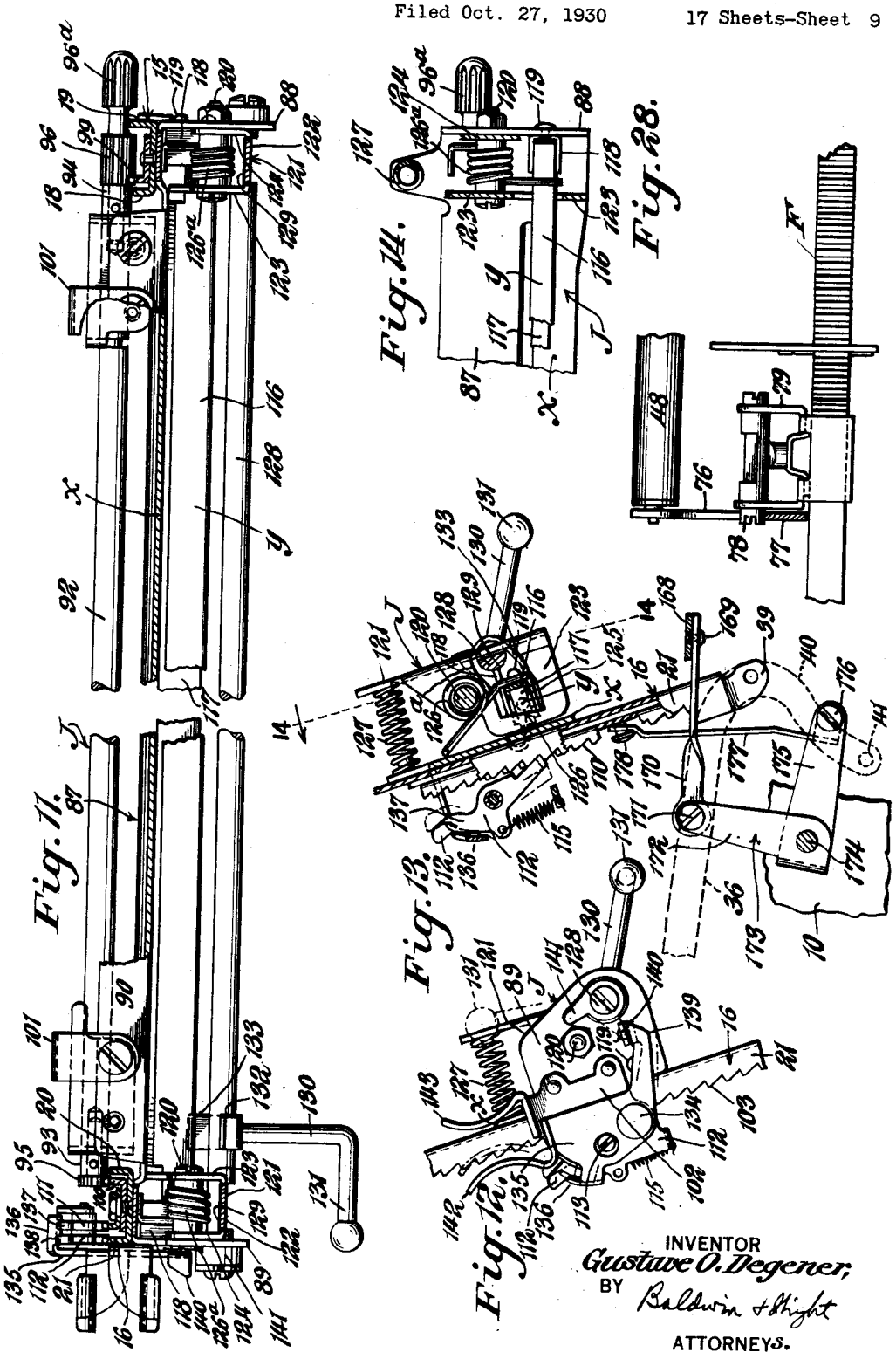

Fig. 11.

Fig. 14.

Fig. 28.

Fig. 13.

Fig. 12.

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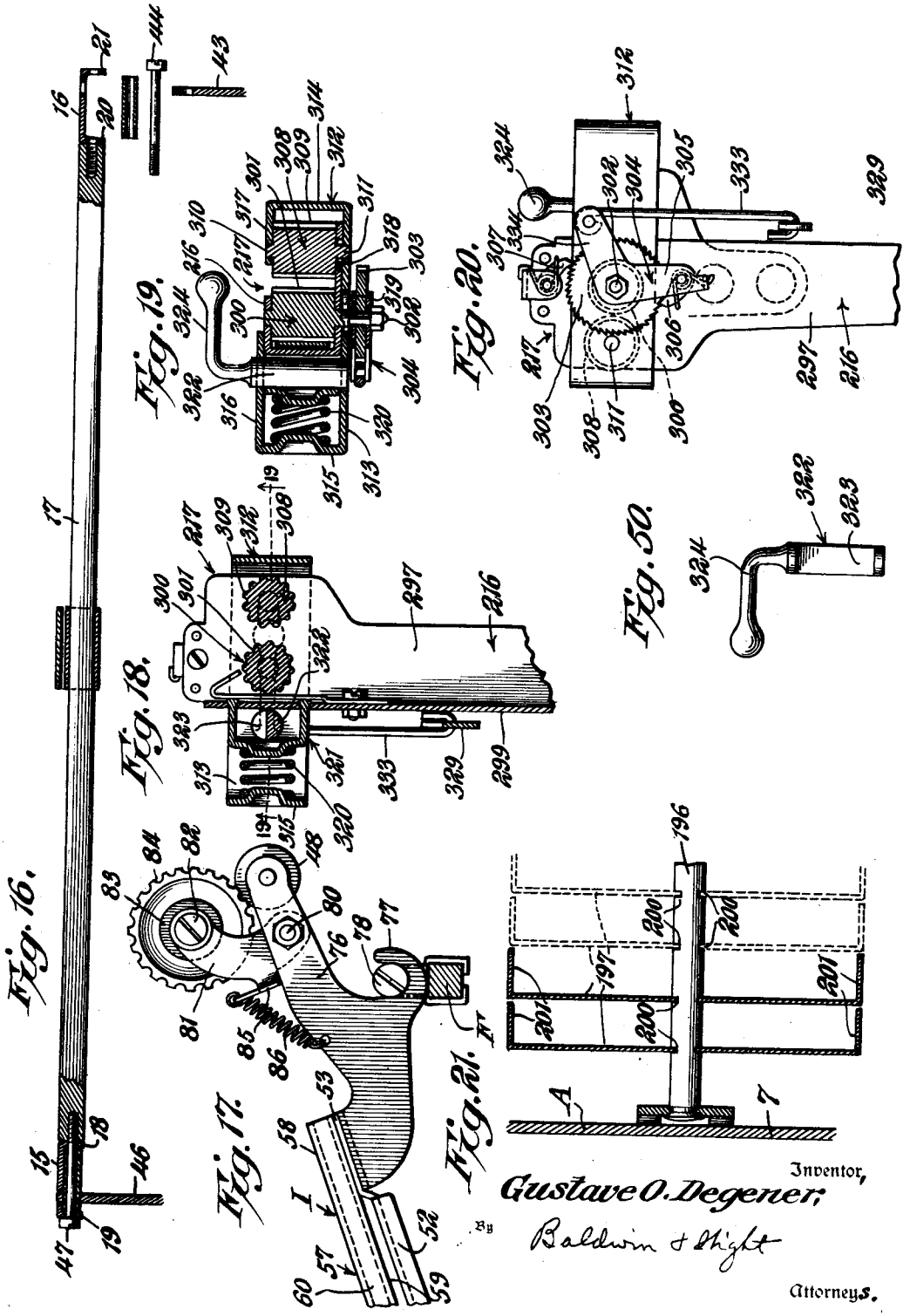

Fig. 16.

Fig. 17.

Fig. 18.

Fig. 19.

Fig. 20.

Fig. 20a.

Fig. 21.

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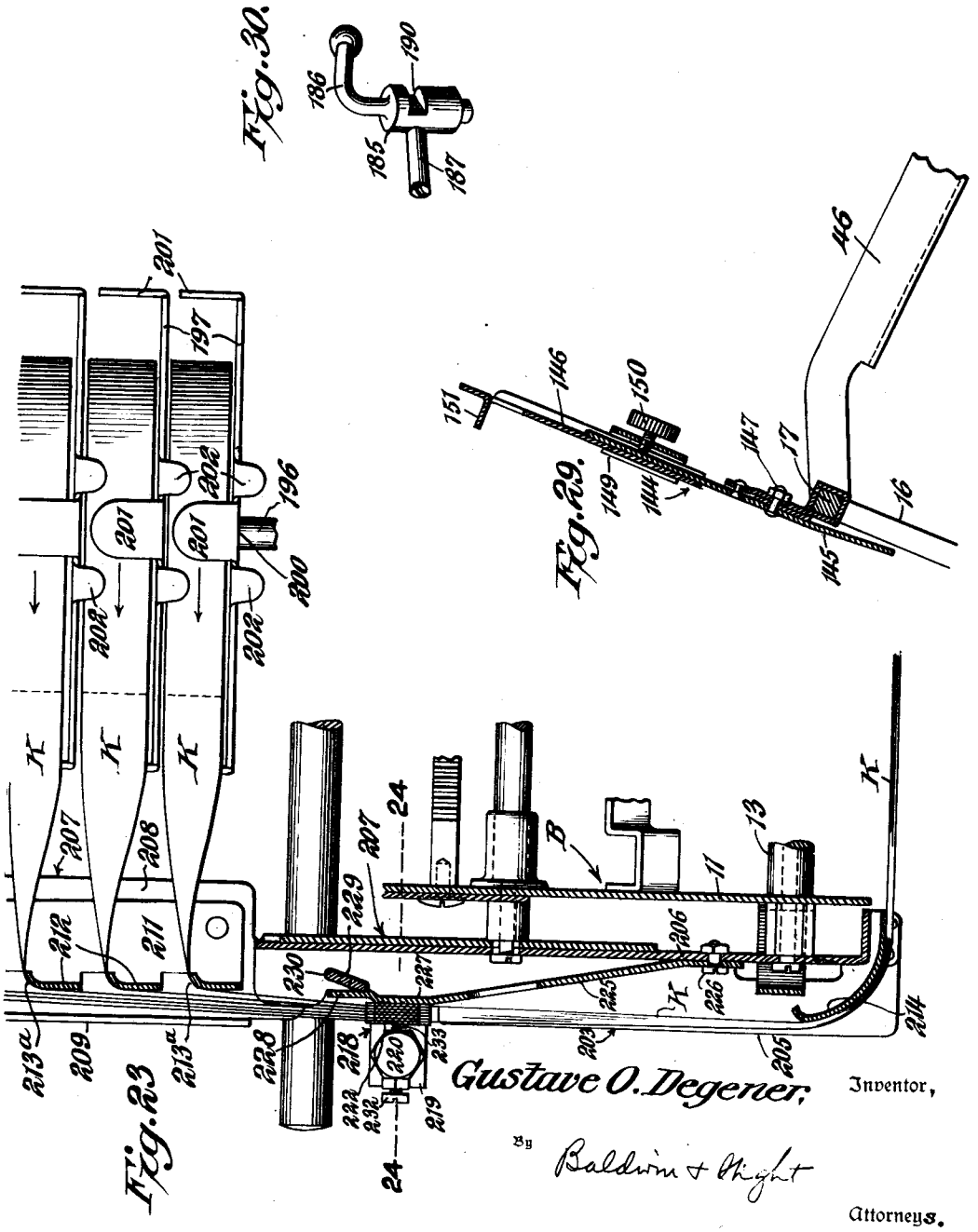

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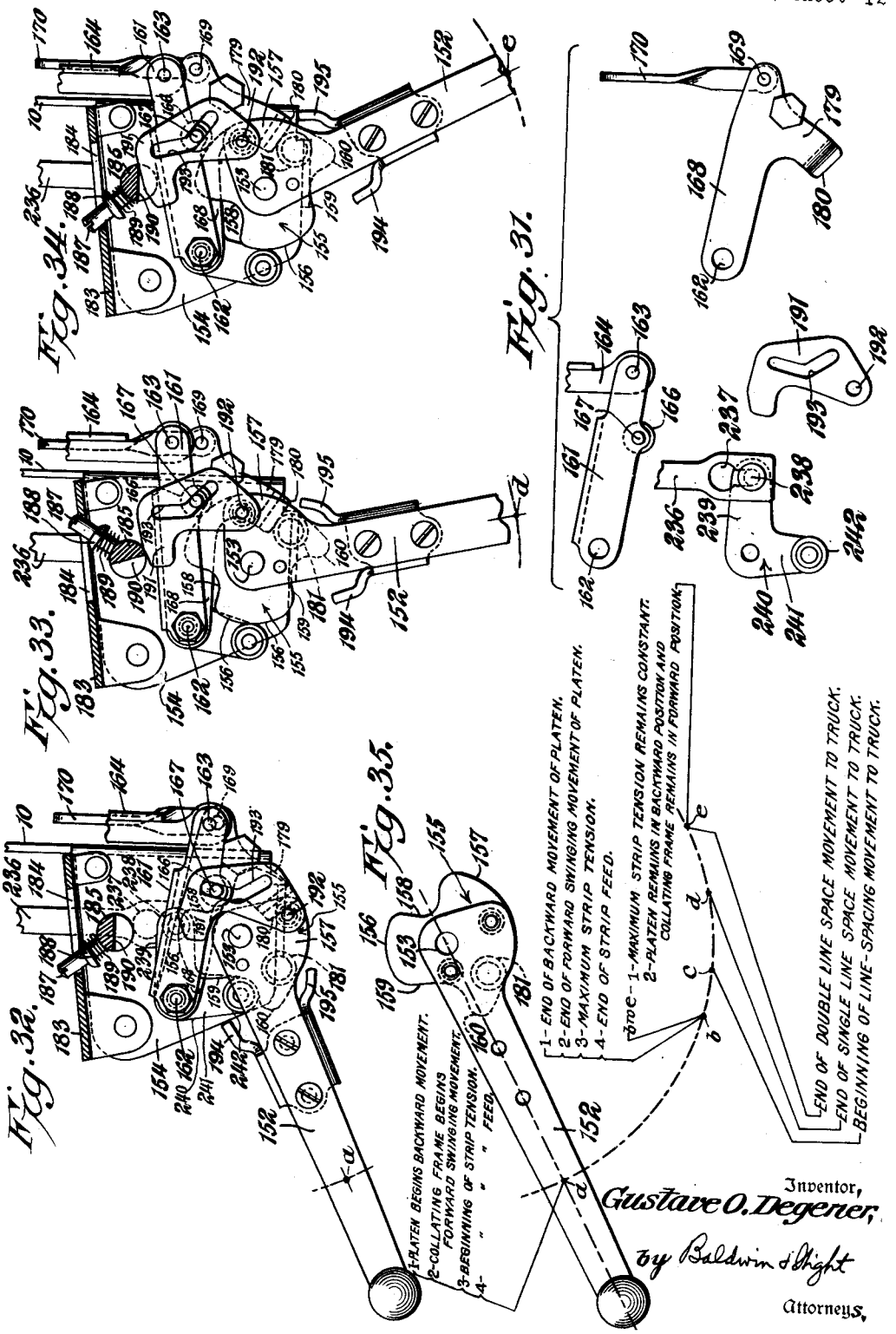

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MANIFOLDING DEVICE

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Fig. 36.

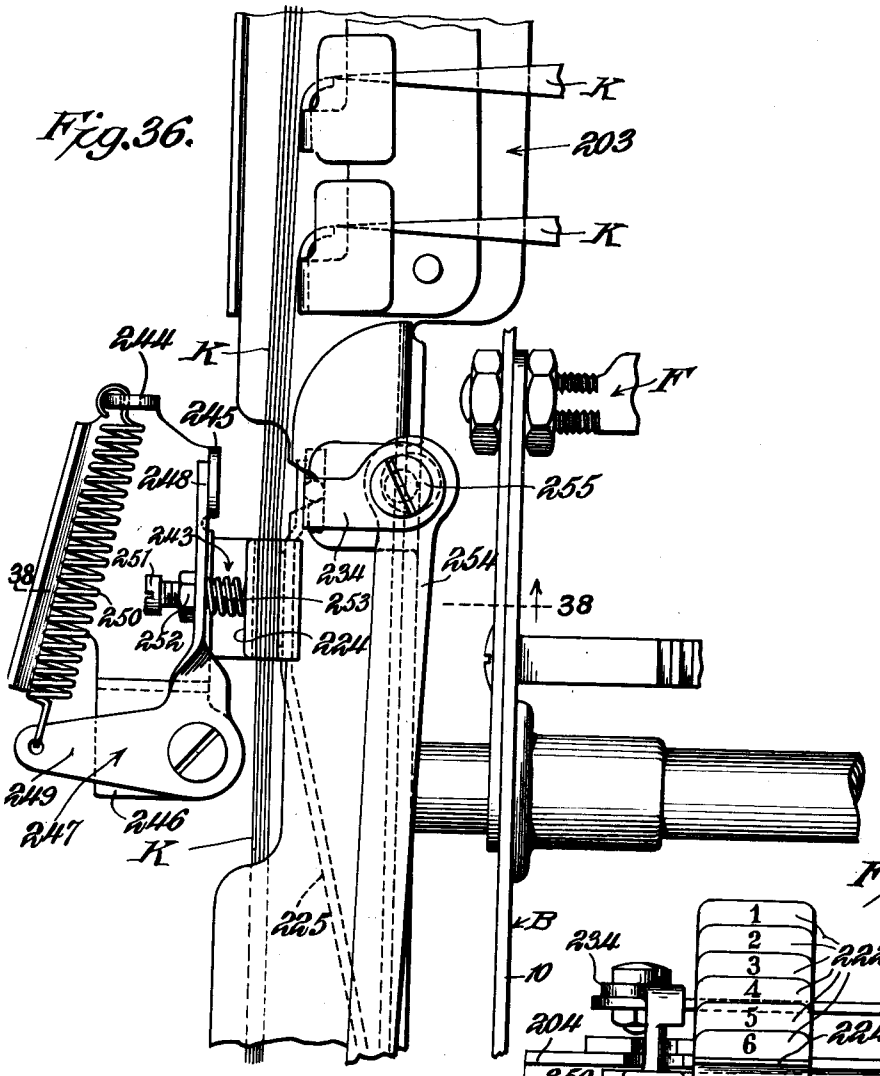


Fig. 37.

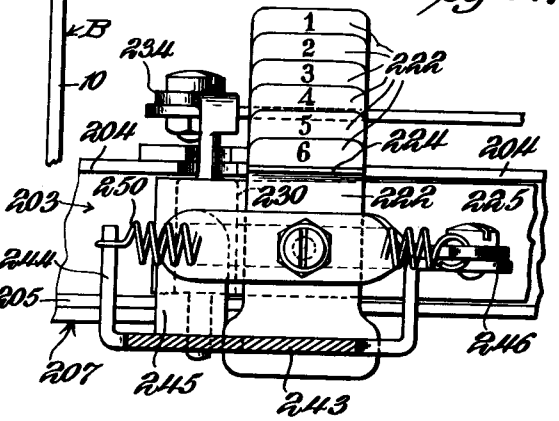
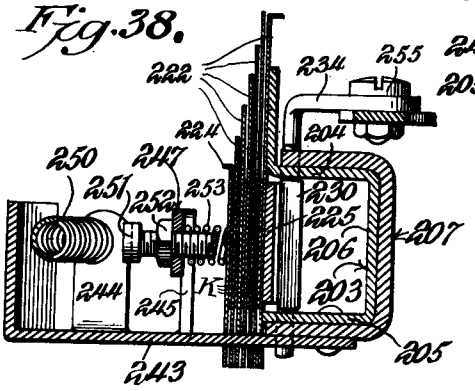


Fig. 38.



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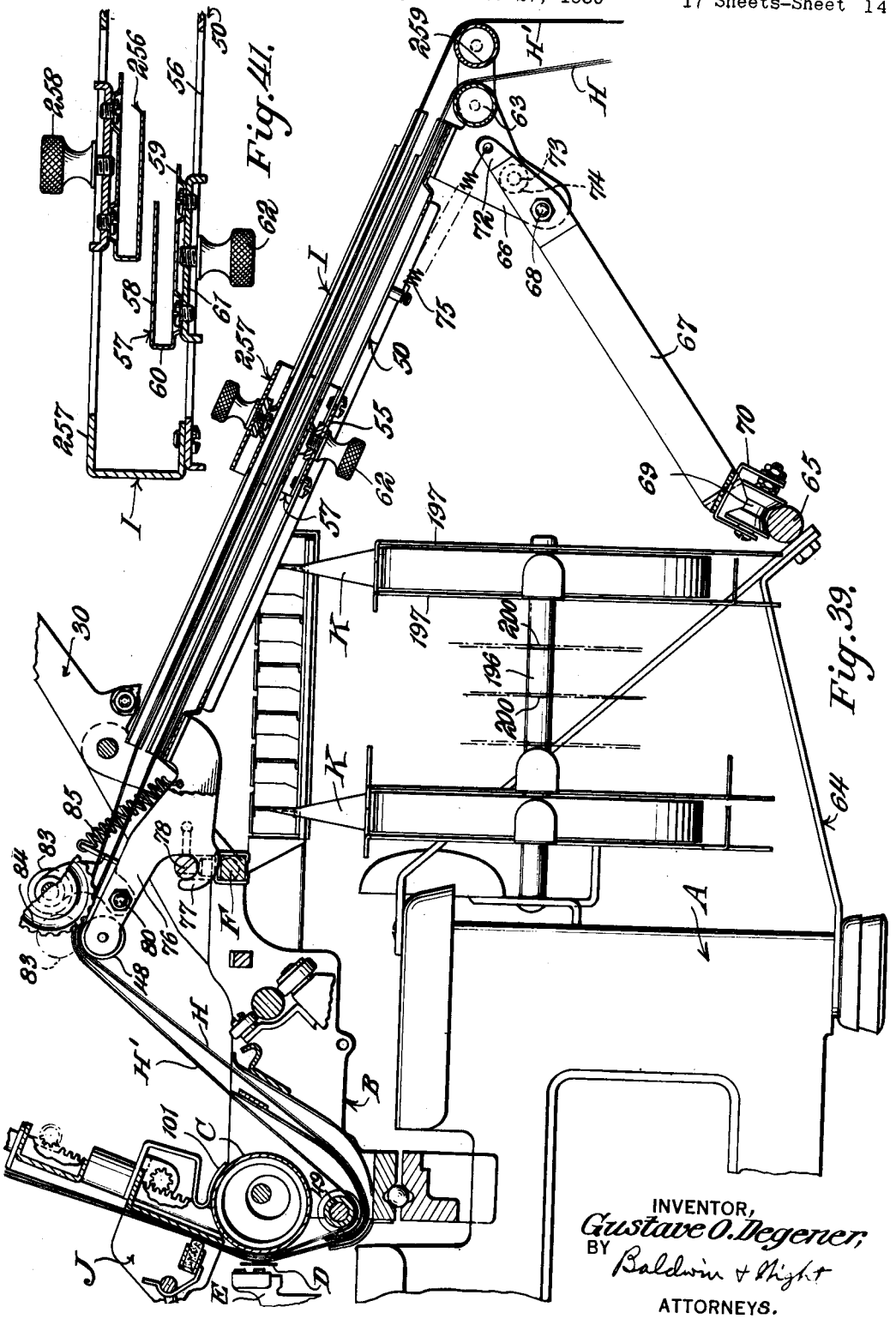

Fig. 41.

Fig. 39.

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MANIFOLDING DEVICE

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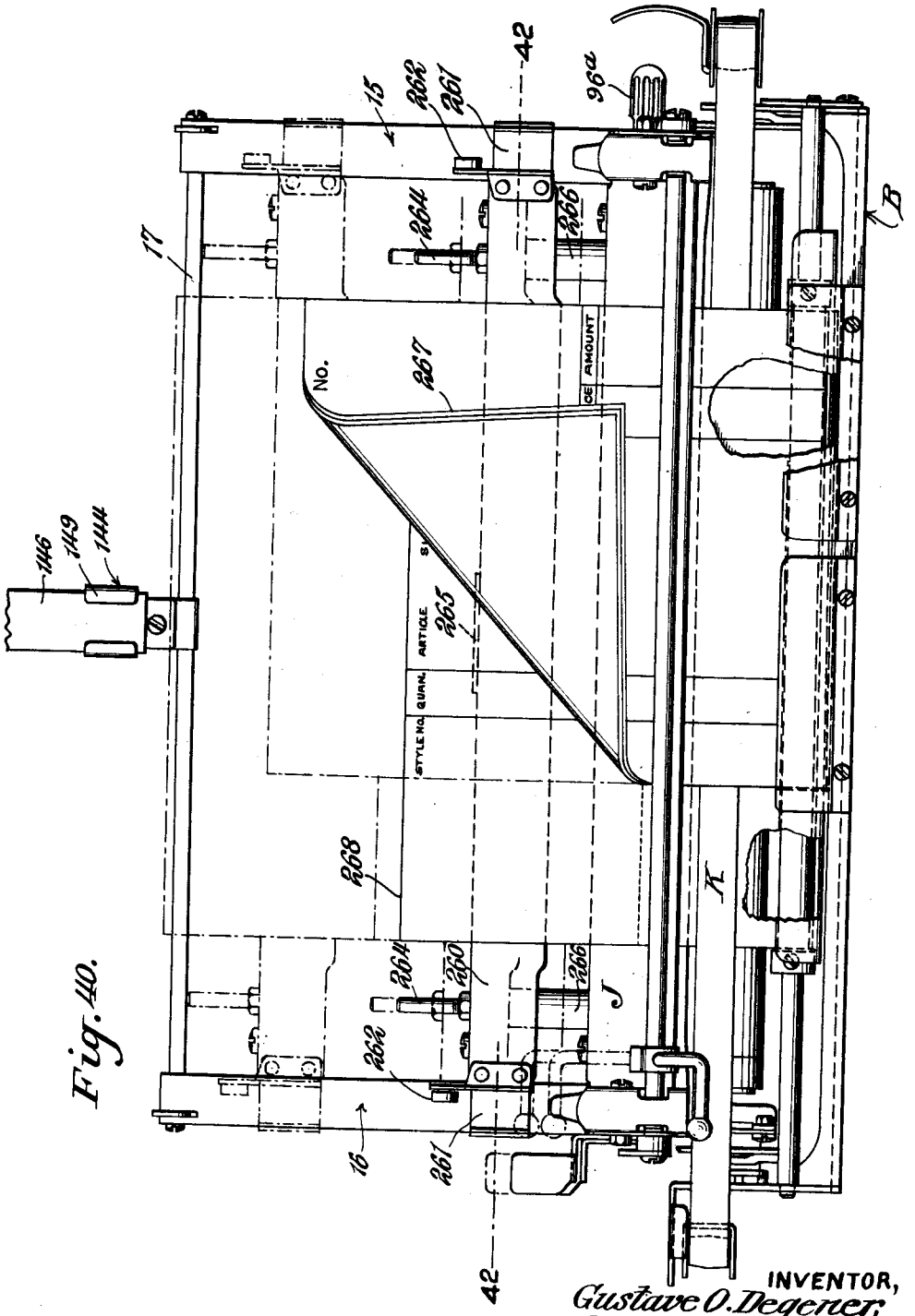

Fig. 40.

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MANIFOLDING DEVICE

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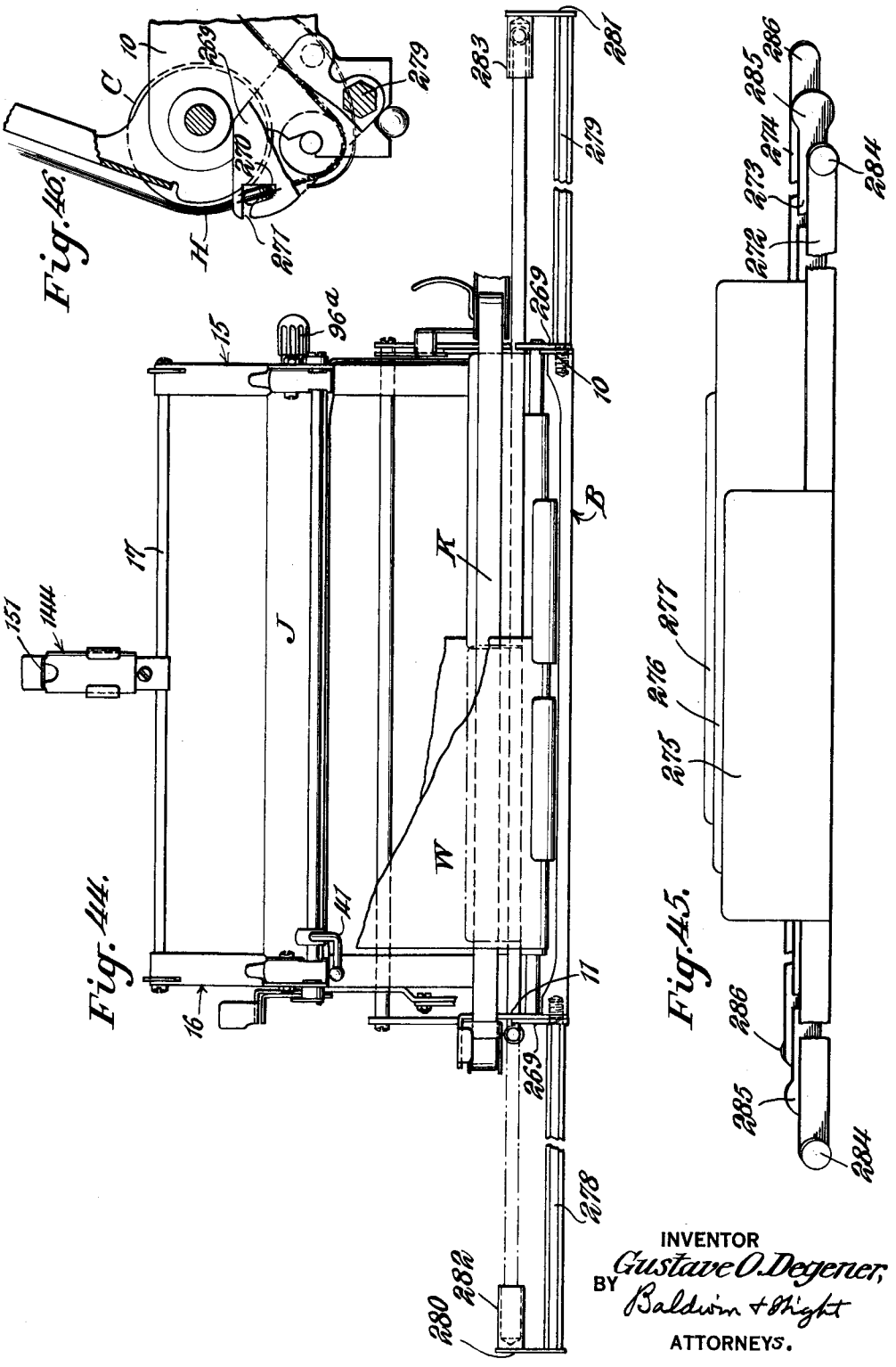

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MANIFOLDING DEVICE

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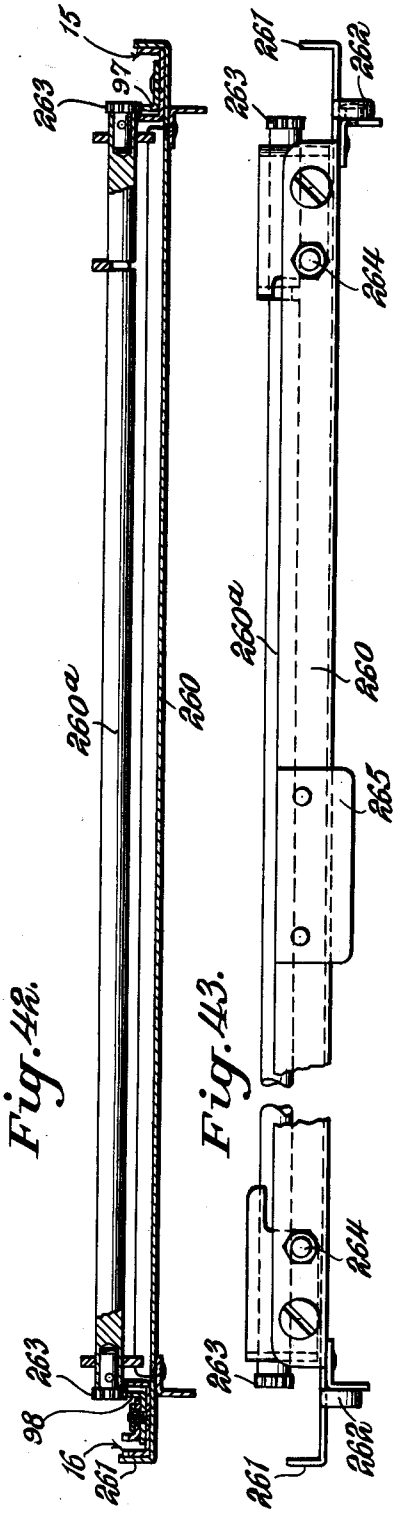

Fig. 42.

Fig. 43.

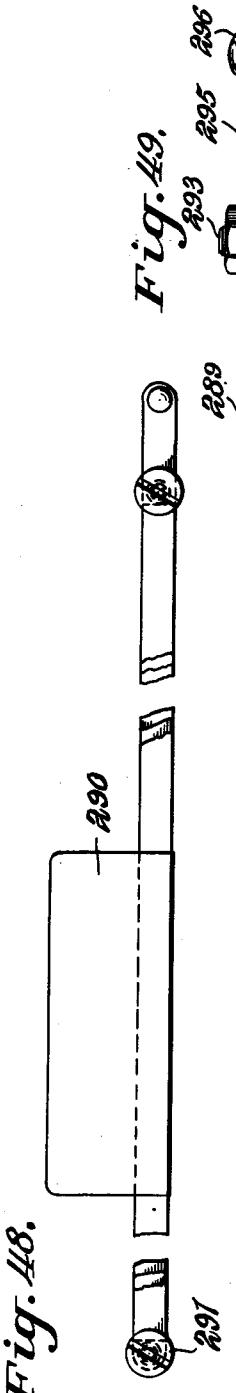

Fig. 48.

Fig. 49.

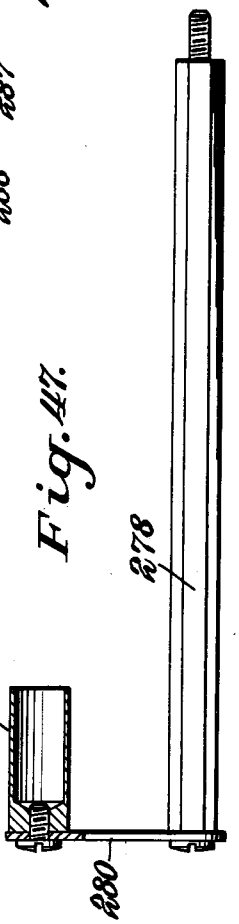

Fig. 47.

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Patented Apr. 12, 1932

1,853,761

UNITED STATES PATENT OFFICE

GUSTAVE O. DEGENER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO ROYAL TYPEWRITER COMPANY, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

MANIFOLDING DEVICE

Application filed October 27, 1930. Serial No. 491,558.

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 Sept. 3, 1926, and in the divisional application thereof Serial No. 194,135, filed May 25, 1927, and in 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 forms of work sheets which are frequently in lengths of several hundred feet.

Among the several objects of this invention are to provide a single operating lever, such as the carriage return lever, for first bodily moving the platen rearwardly and thereby relieve the normal tight contact relation between the platen and the work sheets and interleaved carbon strips, to apply a gradually increased tension to the carbon strips and to simultaneously effect a feeding of said strips during the backward movement of the platen, and to effect a line spacing movement to the paper clamp while the platen is in its relieved position and subsequent to the carbon strip feeding movement but while the maximum tension on the carbon strips is maintained, whereby the work sheets during the feeding movement will not only be relieved of their normal tight contact relation with the platen but will also be fed without dragging the carbon strips therewith; to mount one or more ribbon spools on a single spindle which extends rearwardly from the main frame and is rigidly connected thereto, and to provide separating discs between the spools and to detachably mount said discs on the spindle whereby said discs will not only maintain the spools in separated relation but will be retained against rotation with the spools; to provide means for guiding the strips forwardly from the spools along the left hand side of the machine, thence toward the right in front of the platen and in interleaved relation with the work sheets, and thence rearwardly along the right hand side of the machine to a strip feeding mechanism; to provide a strip tensioning device located on the left hand side of the machine for applying a gradually increased tension to the strips during each feeding movement thereof, the tensioning device including a yieldable stop against which the strips are forced and which functions to permit the strips to be fed through the tensioning device during the entire time the tension is being gradually increased; to provide a rock shaft which is actuated by the carriage return lever and separate connections between the rock shaft and the platen supporting elements and between the rock shaft and the strip feeding means whereby upon movement of the rock shaft the platen will be bodily moved either backwardly or forwardly and the carbon strips will be fed during the backward movement only of the platen; to provide a collating frame for the work sheets and to mount a truck on the frame for step-by-step movements therealong for line spacing the work sheets by a swinging movement of the manually operable carriage return lever; to provide manually operable means for disengaging the truck from the line spacing mechanism so as to permit the truck to gravitate along the collating frame to its initial position; to provide said truck with a manually operable means for first releasing the clamp of the truck from the work sheets and for subsequently releasing the truck from the line spacing mechanism; to provide a novel means for mounting the non-rotatable platen on the collating frame and for mounting the entirety on the carriage whereby upon operation of the carriage return lever the collating frame will be swung forwardly and the platen will be bodily moved rearwardly; to provide the collating frame with a vertically adjustable cross bar above the clamp for forming a movable clamping member for the lead-in ends of certain of the work sheets whereby the latter may be separated from the carbon strips by the operator; to provide a table in rear of the platen and movable with the carriage for supporting the work sheets as they are fed

forwardly past the platen and to provide said table with laterally adjustable guides for the work sheets whereby the guides may be adjusted for accommodating work sheets of different widths; to provide such a table with superposed paper guides which are laterally adjustable independently of one another whereby two sets of work sheets of different widths, one under the other, may be led to the platen; to provide the table with one or more freely rotatable rolls at the receiving end of the table for guiding the work sheets upwardly and thence forwardly on to the table, and to provide a cutout attachment adapted to be interleaved with the work sheets and carbon strips for preventing writing on certain parts of some of the work sheets as may be desired.

In the drawings:—

Figure 1 is a top plan view of a typewriter carriage embodying my invention,

Figure 2 is a front elevation thereof,

Figure 3 is a right hand elevation of the carriage,

Figure 4 is a left hand elevation of the carriage,

Figure 5 is a rear elevation of the machine showing the application of my invention, the collating frame being broken away,

Figure 6 is a rear elevation of the collating frame, showing the paper truck thereon, the mechanism for raising the truck, and the means for supporting the frame and platen,

Figure 7 is a vertical sectional view showing the collating frame in its normal or rearwardly inclined position, and the platen in its normal or forward printing position.

Figure 8 is a similar view but showing the collating frame in its forward position and the platen in its rearward position,

Figure 9 is a view in elevation of one of the side bars forming the collating frame,

Figure 10 is a fragmentary view in elevation of one end of a link which supports the collating frame and the platen,

Figure 11 is a horizontal sectional view taken on the line 11—11 of Figure 2,

Figure 12 is an enlarged detailed elevation showing the means for releasing the movable clamping bar of the truck and for simultaneously releasing the holding pawls of the truck from the collating frame,

Figure 13 is a vertical sectional view showing a modified form of truck wherein the clamping bar is slidably mounted, the view also showing separate connections for raising the truck,

Figure 14 is a sectional view taken on the line 14—14 of Figure 13,

Figure 15 is an enlarged perspective view showing particularly the means for holding the paper truck in different positions on the collating frame and the hand operated means for releasing the truck from the frame,

Figure 16 is a detail view of the upper cross bar of the collating frame showing its connection to one of the side bars of said frame,

Figure 17 is an enlarged detailed side elevation showing the manually operable paper feed roll in its normal or non-feeding position,

Figure 18 is an enlarged horizontal section of the carbon strip feeding means,

Figure 19 is a vertical sectional view taken on the line 19—19 of Figure 18,

Figure 20 is a bottom plan view of the ratchet feed mechanism for the carbon strips,

Figure 21 is a detailed horizontal sectional view showing the means employed for supporting the separating discs for the carbon strip spools,

Figure 22 is a perspective view showing one of the separating discs for the carbon spools,

Figure 23 is an enlarged horizontal sectional view of the strip tensioning device,

Figure 24 is an enlarged vertical cross-section through the carbon strip tensioning device and taken on the line 24—24 of Figure 23,

Figure 25 is a vertical sectional view showing more or less diagrammatically a modified form in which the lower guide roll is disposed further forward of the machine,

Figure 26 is a similar view but showing the work sheets in a vertical plane and separated from the platen,

Figure 27 is an enlarged detail side elevation showing the spring connection between the table and the support therefor,

Figure 28 is an enlarged elevation showing the connection between the front of the table and the carriage,

Figure 29 is an enlarged vertical sectional view through the end gage for the work sheets,

Figure 30 is a perspective view of the adjustable post with which the carriage return lever cooperates for limiting the line spacing movement of the work sheets to either a single or a double movement,

Figure 31 is a view showing the separated parts which the carriage return lever cooperates for effecting certain movements to the work sheets and carbon strips,

Figure 32 is a horizontal section showing the carriage return lever in its normal position and with the various co-operating elements in their normal position,

Figure 33 is a similar view but showing the carriage return lever moved to a position for effecting a single line spacing movement to the work sheets,

Figure 34 is a view similar to Figure 33 but showing the carriage return lever moved to a position for effecting a double line spacing movement to the work sheets,

Figure 35 is a view of a timing diagram showing the extent of movement of the collating frame and the platen, the time of feed-

ing the carbon strips, and the time of applying the tension to said strips,

Figure 36 is an enlarged top plan view showing a tensioning device of modified form,

Figure 37 is a front elevation thereof,

Figure 38 is a vertical cross sectional view taken on the line 38—38 of Figure 36,

Figure 39 is a vertical sectional view through the carriage and paper guide, illustrating a modification wherein work sheets of different widths are employed,

Figure 40 is a front elevation thereof,

Figure 41 is an enlarged detail vertical sectional showing of the adjustable upper and lower guides for the work sheets,

Figure 42 is a horizontal section taken on the line 42—42 of Figure 40,

Figure 43 is a top plan view of the vertically movable bar shown in Figures 40 and 42,

Figure 44 is a front elevation of the carriage showing the application of the cutout devices thereto,

Figure 45 is an enlarged elevation of the cutout devices,

Figure 46 is an end elevation of the carriage showing one of the brackets for supporting the cutout devices,

Figure 47 is an enlarged front elevation, partly in section, of the socket supporting bracket,

Figure 48 is a view similar to Figure 45 but showing a modified construction of cutout devices,

Figure 49 is a top plan view of one end thereof, and

Figure 50 is a view in elevation of the cam shaft of the carbon strip feeding means.

The invention as illustrated in the accompanying drawings is shown as being applied to the well known standard Royal typewriting machine, but it is to be understood that my invention is adapted to be applied to other types of typewriting machines, or to calculating machines and the like.

The typewriting machine includes a main frame A, a carriage B, a platen C, a main ribbon D, type bars E which are operated in the usual manner, and the usual tabular stop rod F.

The main frame A includes side walls 5 and 6 and a rear wall 7. Fixed to the main frame A is a bottom rail 8 for supporting the carriage B through the medium of a top rail 9 fixed to the carriage.

The carriage includes end plates 10 and 11 respectively, and rigidly connected to the front portions of the end plates is a rod 13. Journaled on this rod adjacent the inner faces of the end plates are hanger arms 14, 14 which form a pivotal support for a collating frame G and the platen C, the latter being rigidly connected to the former. The collating frame G includes spaced channel shaped side bars 15 and 16 which are rigidly connected at their upper ends by a cross rod 17 which is angular in cross section, and at their lower ends by the platen C. The side bars 15 and 16 are arranged so that the channels open rearwardly. The side bar 15 is thus provided with inner and outer longitudinal flanges 18 and 19 respectively and the side bar 16 is provided with inner and outer longitudinal flanges 20 and 21 respectively. Integral with the lower ends of the flanges 18 and 20 of the side bars 15 and 16 respectively are inwardly extending cup-shaped heads 22, each head including a circular wall 23 arranged in the plane of the flange 18 or 20 to which it is attached and a circular flange 24, the wall 23 being provided with a circular opening 25 for receiving the rod 13, the openings 25 being of larger diameters than the rod 13 so as to permit bodily movement back and forth relative to said rod. The platen C is preferably formed of tubular metal and the ends of the platen surround the circular flanges 24. The end portions of the platen are longitudinally slotted as at 26 and a clamp 27 surrounds each end portion of the platen and functions to rigidly connect the platen with the heads 22. It will thus be seen that the platen C forms a rigid connection between the lower ends of the side bars 15, 16 of the collating frame, and that the platen is bodily movable with said frame. In order to retain the platen C and the frame G against longitudinal movements along the rod 13, I have mounted two stop collars 28, 28 on the rod 13 beyond the heads 22, the diameters of the collars being greater than the diameters of the openings 25.

Journaled in the rear ends of the end plates 10 and 11 of the carriage is a rock shaft 29 and fixed to said rock shaft adjacent the ends thereof are rock levers 30 and 31 respectively, the lever 30 including an upwardly extending arm 32 and a downwardly extending arm 33, and the lever 31 including an upwardly extending arm 34 and a downwardly extending arm 35. Substantially horizontal links 36 extend rearwardly from the platen C toward the rock shaft 29. These links 36 extend under the rock shaft 29 and have their rear end portions curved upwardly and pivotally connected to the arms 32 and 34 of the levers 30 and 31, as at 37 and 38 respectively. The front ends of these links 36 are pivotally connected as at 38*a*, 38*a* to depending lugs 39, 39 integral with the lower ends of the side bars 15, 16 of the collating frame. The front ends of the links 36 extend beyond the pivots 38*a* and terminate in downwardly extending arms 40, 40 which are pivotally connected at their lower ends as at 41—41 to the lower ends of the hanger arms 14, 14. Pivotally connected to the upper end of the lever arm 30 by a pivot bolt 42 is the rear end of a link 43, the front end of said

link being pivotally connected to the collating frame by a pivot screw 44 which also serves to detachably, although rigidly, connect the upper cross bar 17 with the side bar 15. Pivotally connected to the upper end of the lever arm 31 by a pivot bolt 45 is the rear end of a link 46, the front end of said link being pivotally connected to the collating frame by a pivot screw 47 which also serves to detachably, although rigidly, connect the upper cross bar 17 with the side bar 16.

The collating frame G in its normal position is inclined rearwardly as shown in Figures 3 and 7. In this position of the frame, the platen C is located in its normal or printing position. When, however, the shaft 29 is rocked in a counter-clockwise direction, the levers 30 and 31 through the medium of the links 43 and 46 together with the links 36, 36 cause the collating frame G to swing forwardly and the platen C to swing rearwardly to the position shown in Figure 8. Thus the platen C is bodily moved rearwardly from its normal writing position to its abnormal or non-writing position.

The work sheets H are generally arranged in a roll positioned in rear of the machine and the lead-in ends of the work sheets are fed forwardly over a table I, thence over a roller 48 located between the platen C and said table, thence downwardly under a lower guide roller 49 located below the platen C, thence upwardly past the platen and in rear of the main ribbon D, and the end portions are removably clamped to a truck J which is mounted on the collating frame G for upward line spacing movements.

The table I includes a supporting plate 50 of skeleton form as shown particularly in Figure 1. This supporting frame includes side bars 51, 52, front and rear cross bars 53, 54 and an intermediate cross bar 55 which is rigidly connected with the side bars. This intermediate cross bar 55 is provided with elongated slots 56, 56. As shown in Figure 1, the table I is provided with two guides 57, 57 for the work sheets. Each guide includes spaced top and bottom leaves 58 and 59 which are connected along one edge by a wall 60, thereby forming a channel shaped guide which opens inwardly. Rigidly attached to the under face of the bottom leaf 59 is a guide rib 61 which rides in the associated slot 56. A clamping screw 62 is threaded into a correspondingly threaded opening in the guide rib and cooperates with said rib and supporting plate 50 to clamp the guide 57 in any position of lateral adjustment. By means of the guide ribs 61 the guides 57 are capable of being adjusted laterally relative to each other and to maintain their parallel relation during such adjustment. By reason of these guides 57 being laterally adjustable, work sheets H of different widths may be readily employed in this machine.

Disposed along the rear edge of the supporting plate 50 is a roll 63 which is freely journaled in ears carried by the frame 50, the roll functioning to permit the work sheets to easily turn from a vertical plane into the substantially horizontal plane of the table I.

Extending rearwardly from and rigidly attached to the rear wall 7 of the machine frame A is a pair of brackets 64, 64 and rigidly secured to these brackets is a track rail 65. Rigidly connected to the rear end of the supporting frame 50 and depending therefrom are bracket arms 66, 66. A V-shaped supporting arm 67 is pivotally connected at its upper ends as at 68, 68 to the bracket arms 66, 66. A supporting roller 69 is journaled in a bracket 70 fixed to the under face of the apex portion 71 of the V-shaped arm 67 and this roller is engageable with the track rail 65. The upper end portions of the arm 67 extend above the pivot 68 to form short lever arms 72, 72 and these arms are respectively provided with outwardly extending stop pins 73, 73 which project into openings 74, 74 formed in the depending arm 66 to thereby limit the swinging movement of the supporting arm 67. Coil springs 75, 75 are each connected at one end to the upper end of the lever arm 72 and at the other end to the under side of the supporting frame 50 and function to yieldably urge the supporting arm 67 outwardly and thereby maintain the roller 69 in contact with the track rail 65.

The forward end of the supporting plate 50 of the table I is provided with forwardly extending arms 76, 76 and freely journaled in the extreme ends of these arms is the roll 48 over which the work sheets H pass. The arms 76 are each provided with an upwardly opening hook 77. The hooks 77 rest on the tabular stop rod F and engaged under screws 78, 78 carried by brackets 79, 79 which are independently adjustable along the tabular stop rod F.

Journaled on the forwardly extending arms 76, 76 and disposed directly in rear of the roll 48 is a rock shaft 80. Fixed to the ends of this rock shaft are rock arms 81, 81 and journaled in these rock arms 81 is a shaft 82 having one or more feed rolls 83 fixed thereon. One end of this shaft extends beyond the right hand rock arm 81 and is provided with a hand wheel 84. The arms 81 are each provided with a laterally extending ear 85 and these ears normally engage the arms 81 to limit the rearward swinging movement of the roll-carrying shaft 82. A coil spring 86 is connected at one end to one of the arms 76 and at its other end to one of the ears 85 and functions to yieldably retain the roll carrying shaft 82 in its abnormal or non-feeding position. When it is desired to move the feed rolls 83 for cooperation with the roll

48 to manually feed the work sheets H either forwardly or backwardly, the operator takes hold of the hand wheel 84 and rocks the arms 81, 81 forwardly against the tension of the spring 86 until the feed rolls 83 are in position to properly cooperate with the feed roll 48 to feed the work sheets, the spring 86 functioning to automatically return the roll carrying shaft 82, and the rolls 83 carried thereby, to its abnormal or inoperative position as soon as the hand wheel 84 is released by the operator.

The lead-in ends of the work sheets H after passing over the guide roll 48 pass forwardly and downwardly under the lower guide roll 49, which is freely journaled in the end plates of the carriage, and thence upwardly past the platen C as previously stated and have their free ends clamped to the vertically movable truck J.

The paper truck J includes a relatively stationary clamping plate x and a relatively movable clamping plate y between which the free ends of the work sheets are adapted to be clamped. The relatively fixed clamping plate x is disposed in front of the movable plate y and is rigidly secured to a cross bar 87 of sheet metal which extends between the two side bars 15 and 16 of the collating frame, and rigidly connected to its ends are forwardly extending brackets 88 and 89. The cross bar 87 is of channel-shaped construction which opens rearwardly and includes a top flange 90. Fixed to the top flange 90 is a pair of brackets 91, 91 and journaled in said brackets is a horizontal shaft 92 having collars 93, 94 fixed thereon beyond the brackets so as to retain said shaft against longitudinal movements. Fixed to the collar 93 and preferably formed integral therewith is a gear 95. Rigidly connected to the other end of the shaft adjacent the collar 94 is a gear 96 and an axially extending handpiece 96^a which is rigidly connected to said gear. Rigidly mounted within the channels of the side bars 15 and 16 of the collating frame are rack bars 97 and 98 respectively which extend longitudinally of said side bars and are provided with rearwardly extending flanges having gear teeth 99 and 100 respectively. The gears 95 and 96 on the shaft 92 respectively mesh with the teeth 100 and 99. Thus upon manipulation of the shaft 92 by the operator's hand through the medium of the handpiece 96^a, the truck J may be raised or lowered and by reason of the gears 95 and 96 being constantly in mesh with the teeth of the rack bars the truck will be maintained in its horizontal position and will be adjusted vertically without any binding action occurring at either end of the truck.

Also fixed to the rigidly extending flange 90 of the cross bar 87 is a pair of S-shaped spring stop fingers 101, 101 which are adapted to engage the platen C whenever the truck is moved to its lowermost position.

Rigidly secured to the cross bar 87 of the truck at the end thereof adjacent the side bar 16 of the collating frame is a rearwardly extending bracket or plate 102. The outer flange 21 of the side bar 16 of said collating frame is provided with a longitudinal series of ratchet teeth 103. A lifting bar 104 is slidably mounted longitudinally on the rack bar 98 through the medium of upper and lower guide pins 105 and 106 fixed to the rack bar 98 and longitudinal slots 107 and 108 formed in the lifting bar 104. This lifting bar 104 is provided with a rearwardly extending flange 109 having a longitudinal series of ratchet teeth 110. A lifting pawl 111 and a holding pawl 112 are fulcrumed on a pin 113 fixed to the bracket plate 102 of the truck, the lifting pawl 111 engaging the teeth 110 of the lift bar 104 and the holding pawl 112 engaging the teeth 103 of the side bar 16 of the collating frame. These pawls are normally held in engagement with said ratchet teeth by means of coil springs 114 and 115. It will thus be seen that when the lifting bar 104 is elevated, the lifting pawl 111 will cause the truck J to be correspondingly elevated and when pressure is released from the lifting bar 104 the holding pawl 112 will retain the truck in its elevated position. The distance between any two adjacent teeth 103 corresponds to the distance of a single line spacing movement. It will therefore be apparent that as the truck J is elevated step-by-step the work sheets H will be correspondingly line spaced.

The relatively movable clamping plate y comprises a body 116 of sheet metal which is bent into U-shaped cross section for receiving a relatively soft insert 117 of rubber or the like. This insert projects beyond the front edge of the holder 116 as shown in Figure 11 and cooperates with the relatively hard stationary plate x. The ends of the holder 116 extend beyond the ends of the insert 117 and are slidably supported in guide brackets 118, 118 rigidly secured to the bracket plates 88 and 89 respectively by rivets 119 or the like. Thus the movable clamping plate y is supported on the truck for horizontal sliding movements toward and from the relatively fixed clamping plate x. Pivotally mounted upon horizontal studs 120, 120 fixed to the bracket plates 88 and 89 are finger levers 121, 121. Each lever is formed of sheet metal which is bent into U-shaped construction to include a body 122 and spaced inner and outer flanges or walls 123 and 124 respectively. These flanges or walls 123 and 124 are journaled on the supporting studs 120 and the inner flanges 123 are each formed with an opening 125 for receiving the associated end of the holder 116 of the movable clamping plate. The rear vertical wall 126 of each opening

125 is adapted to engage the rear edges of the holder 116 as shown in Figure 13 so that upon oscillation of the finger levers 121 the movable clamping plate y will be moved forwardly out of operative clamping relation with the stationary clamping plate x. A coil spring 126a is wound around each pivot stud 120 and one end of this spring bears against the stationary clamping plate x and the other end of said spring bears against the front face of the movable clamping plate y so as to normally urge said clamping plate into yieldable clamping relation with the stationary clamping plate x. An additional coil spring 127 for assisting the spring 126a is disposed between each stationary clamping plate x and the upper end of each finger lever 121. In order to actuate both finger levers 121 and thereby move the clamping plate y forwardly away from the stationary plate x, I have provided a manually operable cam shaft 128 which is disposed in front of the movable clamping plate y and has its ends journaled in the bracket plates 88 and 89. This cam shaft 128 is recessed as at 129, 129 to form cam surfaces which normally engage the inner faces of the finger levers 121. The cam shaft 128 is provided with a rock arm or lever 130 which terminates in a laterally extending fingerpiece 131. Thus when the rock arm or lever 130 is swung upwardly the rock shaft 128 will be rocked and the cams 129, 129 which engage the finger levers 121 below the pivots 120 thereof will swing the lower ends of said finger levers forwardly against the tensions of the spring 126a and 127 and thereby slide the movable clamping plate y forwardly along its guides 118, 118. In order to limit the extreme oscillating movements of the rock shaft 128, I have provided the same with upper and lower stop arms 132 and 133, the former cooperating with the upper surface of the movable clamping plate when the operating lever 130 is swung upwardly and the latter cooperating with the under surface of said movable clamping plate when the lever is swung downwardly.

After the truck has been elevated step-by-step for a distance equal to the length of a form being written, it is desirable to lower the truck so as to have the same engage the next form, and also to permit the written form to be severed. To this end, I have provided a means which is actuated by the lever 130 for automatically disengaging the pawls 111 and 112 whenever said lever 130 is raised for the purpose of opening the truck J. Pivotally mounted as at 134 on the bracket plate 102 of the truck is a pawl release lever 135 having an arm 136 which extends laterally in rear of the upwardly extending tails 137 and 138 of the pawls 111 and 112. This pawl release lever 135 is provided with a rearwardly extending operating arm 139 having a laterally extending ear 140 at the extreme rear end thereof. Fixed to the adjacent end of the cam shaft 128 is a radially extending release finger 141 which is adapted, upon movement of the cam shaft to engage the ear 140 and thereby swing the pawl release lever 135, to effect a disengagement of the pawls 111 and 112 from their respective ratchet teeth 110 and 103. Thus upon upward movement of the operating lever 130 the movable clamping plate y is moved forwardly to release the work sheets and immediately thereafter the pawls 111 and 112 will be disengaged. The truck J is now free of its line spacing mechanism and may be permitted to drop by gravity along the side bars 15 and 16 of the collating frame, the free ends of the work sheets being held by one hand of the operator so as to permit the truck to gravitate relative to said work sheets. The operating lever 130 is then returned to its normal position so as to effect a clamping action on the next succeeding form, and the written form is then severed by the operator tearing the same along the straight-edge formed by the movable clamping plate y.

Under some circumstances it may be desirable to release the truck from its escapement mechanism without actuating the movable clamping plate and for this purpose, I have provided the pawl release lever 135 with a rigid fingerpiece 142, and the bracket plate 102 with a corresponding fingerpiece 143. Under these circumstances the operator squeezes the fingerpieces together and the pawl release lever 135 is moved in a direction to release the pawls 111 and 112. As long as the operator maintains the pawls in their released position the truck J is free from its line spacing mechanism and consequently the truck may be moved up or down along the side bars 15 and 16 of the collating frame.

Supported on the cross bar 17 of the collating frame is an end gage 144 for the work sheets which includes a relatively fixed section 145 and a relatively extensible section 146, the former being clamped to the cross bar 17 by a screw 147 and the clamping plate 148. The extensible section 146 is adjustably secured to the relatively fixed section 145 by a clamp 149 and clamping screws 150, and the upper end of the extensible section is provided with a forwardly extending flange 151 forming a gage for the lead-in ends of the work sheets. When the machine is initially loaded the extreme free end of the work sheets are fed upwardly through the truck J and are disposed against the flange 151 of the gage. The extensible section 146 of the gage is vertically adjusted so that the first line of writing on the second form is in its proper printing position, and inasmuch as the forms are of uniform lengths the initial setting of the gage will be sufficient. The truck J is then lowered to its lowermost position and clamped to the form which is now in readi-

ness to be written upon. The initial form is then torn off and the operator proceeds with the writing of the forms in succession.

In the normal or writing position of the collating frame G and platen C, the frame is inclined rearwardly as shown in Figure 3 and the platen is in its forward position as shown in said figure. Thus in the normal positions of these parts the work sheets are caused to be bowed forwardly over and against the platen C between the lower guide roll 49 and the truck J. The work sheets are thereby caused to have a fairly tight contact relation with the platen and thereby effect clear writing on the second sheets which is brought about by interleaved carbon strips K. It is desirable to relieve the tight contact relation between the work sheets and the platen during the line spacing operation of the work sheets so as to avoid said sheets being dragged upwardly against the platen and also to avoid dragging the carbon strips upwardly with said sheets.

I have provided a single manually operable lever 152, which in the present case is the carriage return lever, and have provided connections between this lever and the lever 30 for effecting a forward swinging movement to the collating frame and a simultaneous bodily movement rearwardly to the platen, and connections between said lever 152 and the lift bar 104 for effecting a line spacing movement to the truck J.

The lever 152 is pivoted as at 153 to a supporting bracket 154 which extends laterally from the end plate 10 of the carriage. The inner end of the lever 152 is provided with a cam head 155 having diametrically opposite concentric portions 156 and 157, a recess or cam portion 158 between the portions 156 and 157, a recess 159, and an eccentric portion 160 between the concentric portions 156 and 157 and located opposite the recess or cam portion 158. A lever 161 is fulcrumed at one end to a vertically disposed pivot bolt 162 mounted on the bracket 154 and the free end of the lever 161 is pivotally connected as at 163 to the front end of a link 164 which is pivotally connected at its rear end as at 165 to the depending arm 33 of the lever 30. A roller 166 is journaled on a vertical pin 167 on the lever 161, and this roller is normally seated in the recess or cam portion 158 of the operating lever 152. Thus when the lever 152 is moved to the right the roller 166 will ride along the surface of the recess 158 until it is positioned on the concentric portion 157. During this movement of the lever 152, the lever 161 will be swung rearwardly and consequently the link 164 will be also swung rearwardly. This rearward movement of the link 164 will oscillate the lever 30 and the rock shaft 29, and the lever 30 together with the lever 31 will swing the collating frame G forwardly to an upright position from the position shown in Figure 7 to the position shown in Figure 8, and simultaneously cause the platen C to be moved rearwardly a distance sufficient to relieve the normal tight contact relation between the work sheets and the platen.

In order to effect line spacing movements to the truck J by the hand lever 152 subsequent to the platen C being moved to its rearmost position, I have provided a lever 168 which is pivoted on the pivot bolt 162, and pivotally connected to the free end of this lever as at 169 is the front end of a link 170, the rear end of said link being pivotally connected as at 171 to the upper end of a vertical arm 172 of a bell crank lever 173 which is pivoted at its angle as at 174 to the end plate 10 of the carriage. The horizontal arm 175 of the bell crank lever extends forwardly and is pivotally connected as at 176 to the lower end of a vertically extending link 177 which is freely pivoted at its upper end as at 178 to the lift bar 104. The lever 168 is provided with a forwardly extending arm 179 which terminates in an upturned end or toe 180. Journaled on the head 156 of the operating lever 152 is a roller 181 which is located on the lever in such a position that when said lever is in its normal position the roller 181 is spaced a considerable distance from the toe 180 of the lever 168 and will not contact with said toe until the operating lever 152 has been swung to the right a distance sufficient to completely move the platen C rearwardly and swing the collating frame G forwardly. Consequently upon continued movement of the operating lever 152, the roller 181 will engage the toe 180 of the lever 168 and thereby swing the latter rearwardly which through the medium of the link 170, bell crank lever 173 and vertical link 177, will elevate the lift bar 104 and thereby effect a line spacing movement to the truck J.

In some conditions of work it may be desirable to effect a single line space movement to the work sheets whereas with other work, it may be desirable to impart a double line space movement to said work sheets. I have, therefore, provided a means which may be adjusted to limit the line spacing movement of the truck to a single space movement or which may be adjusted to permit a double line space movement to be imparted to the truck. To this end, there is mounted upon the bracket 154 a cover plate 182 having a depending rear flange 183 provided with an elongated opening or slot 184. Journaled in the bracket 154 and in the cover plate 182 is a vertically disposed oscillatory post 185 having an operating handle or fingerpiece 186 disposed above the cover plate 182. This post 185 is provided with a laterally extending stop pin 187 which projects outwardly through the slot or opening 184. A collar 188 is loosely mounted on the pin 187 between the flange

183 of the cover plate and the post 185, and a coil spring 189 is disposed around the pin 187 between the collar 188 and the post 185. The post 185 may be oscillated to either of its extreme positions by the handpiece 186, and the spring 189 and the collar 188 will function to retain the post in either of its extreme positions, said extreme positions being determined by the length of the slot or opening 184. When the stop pin 187 is in the position shown in Figures 32 and 34, a double space movement may be imparted to the truck J, and when the pin is oscillated to the right as shown in Figure 33, a single space movement only can be imparted to the truck J. The post 185 is provided with a recess 190, and a limiting plate 191 is pivotally connected to the carriage return lever 152 by a pin 192. This plate 191 extends rearwardly from the pin 192 toward the post 185 and overlies the levers 161 and 168. The pin 167 on which the collar 166 is journaled projects upwardly into an angular slot 193 formed in the limiting plate 191. When the post 185 is in the position shown in Figures 32 and 34, the limiting plate 191 will be moved rearwardly into the recess 190 of said post during movement of the carriage return lever and thereby permit a double line spacing movement to be imparted to the truck J. When it is desired to limit the feeding movement of the truck J to a single line space, the post 185 is turned to the other extreme position as shown in Figure 33, thus turning the recess 190 of said post out of the path of movement of the limiting plate 191. Consequently when the carriage return lever 152 is swung to the right, a single line space movement only will be imparted to the truck J, because further movement of the carriage return lever in the same direction will be prevented by reason of the limiting plate 191 engaging the post 185 and thereby stopping further swinging movement of said lever.

Thus during the first part of the swinging movement of the carriage return lever 152, that is, from the point *a* to the point *b* in Figure 35, the rearward movement of the platen C and the forward swinging movement of the collating frame G will be effected, and during further swinging movement of the carriage return lever in the same direction, that is, between the points *c* and *e*, the line spacing movement to the truck J will be effected. It will, therefore, be apparent that the platen C remains in its extreme backward position during the time the carriage return lever 152 is being moved to the right from the point *b* to either of the points *d* or *e* which indicate the single and double line space positions respectively of the operating lever, and that the line spacing movement to the truck J begins after the platen has reached its extreme backward movement and occurs between the points *c* and *d* or between the points *c* and *e* depending upon whether a single line space movement or a double line space movement is being effected.

The carriage return lever 152 is provided with a pair of fixed stops 194, 195 which cooperate with the bracket 154 to limit the extreme swinging movements of said lever.

As shown particularly in Figures 7 and 8, the position of the lower guide roll 49 is such that the work sheets will remain in contact with the platen C even when the platen is moved rearwardly, but the rearward movement of the platen is sufficient to relieve the normal tight contact relation between the work sheets and the platen.

In Figures 25 and 26, I have shown a slightly modified form in which the lower guide roll 49 is located in a position slightly in advance of the position occupied by the roll in Figures 7 and 8, whereby the platen C when moved to its rearmost position and the collating frame swung forwardly to its vertical position, a complete separation between the work sheets and the platen will be effected.

The invention also includes means for supporting and feeding a plurality of auxiliary ribbons K, which are preferably in the form of narrow carbon strips, across the front of the platen in a direction transverse to the travel of the work sheets H and interleaved therewith. These carbon strips are fed from the rear of the machine from a supply which is supported directly on the main frame of the machine, thence forwardly along the left side of the carriage, thence across the front of the machine where they are interleaved with the work sheets and thence rearwardly along the right hand side of the carriage to a carbon strip feeding mechanism. Tensioning means is mounted on the left hand side of the carriage for gradually applying a tension to the carbon strips during feeding movement thereof and prior to the line spacing movement of the truck J, the maximum tension remaining constant during said line spacing movement.

The paper carbon strips K are of relatively narrow widths and are of indeterminate lengths. These strips are preferably arranged in spool form and the spools are mounted on a common spindle 196 which is fixed to the main frame A of the machine and extends rearwardly therefrom. Mounted on the spindle is a plurality of separating discs 197 between adjacent pairs of which the carbon strip spools are located. The discs 197 are each provided with an eccentric opening 198 which merges into a radially extending slot 199. The diameter of the eccentric opening 198 is slightly greater than the diameter of the spindle 196 whereas the width of the slot 199 is less than the diameter of said spindle. The spindle is provided with a series of opposed transverse recesses 200. The discs 197 are positioned on the spindle 196

by first projecting the spindle through the eccentric opening 198 and then lowering the discs so that the slots 199 will interengage the recesses 200 and thereby retain the discs vertically, and also against rotation on said spindle. Each disc is provided with a plurality of guards 201 which extend laterally from the periphery of the disc and from one face thereof. Each disc is also provided with a pair of guards 202, 202 which extend laterally from the periphery of the disc and from the opposite face thereof, said guards 202 being spaced apart a distance sufficient to receive one of the guards 201 on the adjacent disc, as clearly shown in Figure 1.

Attached to the left hand end plate 10 of the carriage is a horizontally disposed channel bracket 203 which extends fore and aft of the machine and includes a top wall 204, a bottom wall 205, and an inner vertical connecting wall 206. Attached to the bracket 203 and extending rearwardly therefrom is a secondary bracket 207 which includes a bottom 208, an outer vertical wall 209, and a rear wall 210. Attached to the bottom 208 of the secondary bracket 207 is a plate 211 which is provided along its outer edge with a plurality of upstanding guide fingers 212 which are arranged in alinement one behind the other and in spaced relation to one another. The upper ends of the fingers 212 are provided with inwardly extending guard fingers 213 which are all arranged in a common horizontal plane. These guard fingers project rearwardly beyond their supporting guide fingers and the spaces between the guard fingers are restricted so as to permit the respective carbon strips K being passed downwardly therebetween and into the spaces between the guide fingers 212. Preferably the rear end of each guide finger 212 is curved inwardly as at 213*a* to assist the carbon strips in making the necessary right angle turn. The guide fingers 212 are disposed in a plane parallel with and in spaced relation to the wall 209 of the secondary bracket 207 to provide sufficient room for the passage of the carbon strips. These strips as they leave the guide fingers 212 are fed forwardly through the channel shaped bracket 203 and thence around the stationary curved guide 214 which is fixed upon the extreme front end of the bracket 203; thence horizontally in front of the platen C and in interleaved relation with the work sheets H to a vertical roller 215 which is journaled in a channel bracket 216 fixed to the right hand end plate 11 of the carriage, and thence rearwardly within said bracket 216 to the rear end thereof where the ribbons are engaged by an intermittent feeding device 217.

As above explained, it is desirable to apply a tension to the carbon strips K while said strips are being fed, and to retain the maximum tension on said strips during line spacing movement of the truck J. To this end, I have provided an auxiliary tensioning device 218 which is located within the bracket 203 upon the left hand side of the carriage between the ribbon guiding fingers 212 and the fixed strip guide 214. This tensioning device 218 includes a supporting plate 219 which is rigidly connected to the bracket 203 and extends outwardly therefrom. A post 220 is screwed into the plate 219 and secured thereto by a nut 221. The post 220 is disposed in spaced relation to the bracket 203 and a plurality of tension plates 222 of sheet metal are supported by the plate 219 between the bracket 203 and the post 220. These tension plates 222 are provided with rectangular openings in their lower ends for receiving the supporting plate 219, and these openings are of sufficient size to permit the plates 222 to have free movement between the bracket 203 and the post 220. These tension plates 222 increase in height from the outermost plate to the innermost plate, thereby permitting an operator to readily separate any one plate from the next adjacent plate for the purpose of inserting a carbon strip therebetween. The innermost or tallest plate is adapted to be supported by an arm or post 223 which is integral with or otherwise rigidly connected to the top 204 of the bracket 203. The upper end of the outermost or shortest plate 222 is provided with a guard 224 which overhangs the post 220 and functions to guard against any of the ribbons being inserted between the post and the outermost tension plate. Disposed within and extending longitudinally of the bracket 203 is a flat spring 225 and its front end is connected to the vertical wall 206 by means of a clamping bolt or the like 226. The spring 225 is bent outwardly and thence rearwardly to form a flat end portion 227 which registers with the tension plates 222, and the extreme or free end portion of the spring is formed into a slightly offset head 228. The spring 225 is so arranged that in its normal position it does not apply any tension to the carbon strips K. In order to apply a gradually increased tension to the carbon strips, I have mounted a vertically disposed cam shaft 229 in the top and bottom walls 204 and 205 of the bracket 203. Fixed to the cam shaft 229 is a cam 230 which is adapted to engage the head 228 of the flat spring 225 and thereby apply tension to the carbon strips. In order to vary the amount of tension, I have provided the post 220 with a horizontally disposed threaded opening 231. An adjusting screw 232 is mounted within said opening and a coil spring 233 has one end mounted within the opening 231 and bearing against the screw 132, the other end of the spring bearing against the outermost tension plate 222. Thus when the cam 230 is oscillated to move the spring 225 outwardly the amount of re-

sistance may be varied by adjusting a screw 232 as may be readily understood. It is desirable to apply this tension to the carbon strips K during the feeding movements of said strips and to this end, I have provided the cam shaft 229 with a rock arm 234 which is connected to the rear end of a forwardly extending coil spring 235. The forward end of the spring 235 is connected to the rear end of a forwardly extending link 236. The front end of the link 236 is disposed under the bracket 154 and is provided with a slot 237 which receives a pin 238 fixed to one arm 239 of a bell crank lever 240 which is pivoted at its angle to the pivot bolt 162. The other arm 241 of the bell crank lever is provided with a roller 242 which is adapted to normally engage in the eccentric or recess portion 159 of the carriage return lever 152. Thus when the carriage return lever is moved toward the right from the point *a* to the point *b* in Figure 35, the tension on the auxiliary ribbons or carbon strips K will be gradually increased due to the cam 230 moving the flat end of the spring 225 outwardly against the tension plate 222. As above explained, this outward movement of the spring 225 may be variably opposed by the adjustment of the screw 232 so as to adjust the amount of tension imposed on the auxiliary ribbons or carbon strips K. It will also be observed that when the carriage return lever 152 is being moved from the point *a* to the point *b* the roller 242 is being moved upwardly along the eccentric edge portion of the seat 159 of the lever, and as the lever approaches the point *b* the roller begins to ride along the concentric edge portion 156 of said lever, thus maintaining the maximum tension on the auxiliary carbon ribbons during the balance of the swinging movement of the carriage return lever to the right, or in other words, during the line spacing movement of the truck J.

In Figures 36, 37 and 38 I have disclosed a modified construction of tension means for the carbon strips K. In this form a supporting plate 243 is rigidly connected to the bracket 203 and is provided with upstanding ears 244 and 245, the latter constituting a stop. Pivoted on a raised shelf 246 of the plate is a bell crank lever 247 having arms 248 and 249, the arm 248 being yieldably retained against the stop 245 by a spring 250 which is connected at one end to the ear 244 and at the other end to the arm 249 of the bell crank lever. The arm 248 is normally disposed in parallelism with the tension plates 222 and engaged in a threaded opening in said arm 248 is a tension screw 251 which is adjustably held against movement relative to the arm 248 by a clamping nut 252. Normally the inner end of the screw 251 is disposed in spaced relation to the outermost tension plate 222 and a coil spring 253 is disposed around the projecting end of the screw and has its ends bearing against the arm 248 of the bell crank lever and the outermost tension plate 222. In this form a link 254 is pivotally connected at its front end to the bell crank lever 240 and the rear end of this link is directly connected by a pivot screw 255 to the rock arm 234. Thus when the bell crank lever 240 is actuated by the hand lever 152, the link 254 through the rock arm 234 will actuate the cam 230 and thereby apply tension to the carbon strips K. The initial amount of tension applied to the carbon strips may be varied. By maintaining the screw 251 out of contact with the tension plates 222 as shown in Figure 38, the spring 253 will be first compressed before the plates engage the screw 251 and upon continued movement of the cam 230, the bell crank lever 247 will be rocked against the tension of the spring 250; or if it is desired to eliminate the tension of the spring 253 the tension screw 251 may be screwed inwardly until it directly contacts with the outermost tension plate in which event the movement of the cam 230 will be transmitted directly to the yieldable bell crank lever 247.

In some classes of work it is desirable to employ forms of different widths, or to employ two sets of forms of equal width. I have, therefore, shown in Figures 39 and 41 a modified construction of the paper table wherein I have provided a pair of upper paper guides 256 arranged above the lower guides 57. Only one of these paper guides 256 is illustrated in the drawings but it will be understood that the second guide is a duplication thereof. These guides 256 are each identical with the guides 57 except that they extend downwardly as shown in Figure 41 and are supported on a cross plate 257 for adjustment transverse of the machine similar to the lower guides 57. Each of the upper guides 256 is provided with a clamping screw 258 similar to the clamping screw 62 of the lower guide 57 but this clamping screw 258 extends upwardly above the supporting plate 257 and consequently both the lower and upper guides are accessible for transverse adjustments. In Figure 39, I have illustrated an additional set of work sheets H′ which extend over a roller 259 which is disposed in front of the roller 63 and is supported on the paper table I in the same manner. These additional work sheets H′ thence extend forwardly through the upper paper guides 256, thence over the roller 48, thence downwardly under the lower guide roller 49 and thence upwardly past the platen to the truck J, the secondary work sheets H′ being disposed in rear of the work sheets H where they pass the platen. It will thus be seen that when two sets of forms of different widths are employed, the narrow set may be readily centered on the carriage or it may be positioned

either on the left or right hand end of the carriage, the position of the narrow set being determined by the location of the adjustable paper guides.

In Figures 39, 40, 42 and 43, I have illustrated a collating frame which includes a vertically movable gauge or cross bar 260 which is disposed above the truck J and is movable vertically independently thereof. This cross bar 260 is provided at its ends with guides 261, 261 which cooperate with the side bars 15 and 16 of the collating frame, and attached to each guide is a roller 262 which cooperates with said side bars to insure freedom of movement to the cross bar 260. Journaled on the cross bar 260 is a shaft 260*a*, as shown in Figures 42 and 43, and fixed to the ends of this shaft are gears 263, 263 which are in constant mesh with the rack teeth of the rack bars 97 and 98 mounted in the side bars 15 and 16 of the collating frame and serve to eliminate all binding between the cross bar 260 and the side bars of the collating frame when said cross bar 260 is moved vertically. Rigidly secured to the cross bar 260 are two upwardly extending adjustable stop posts 264,264 which contact with the upper cross bar 17 of the collating frame when the cross bar 260 is moved to its upper extreme position. Also rigidly secured to the upper face of the cross bar 260 and located centrally thereof is a plate 265 which extends forwardly of the cross bar for a short distance. Rigidly secured to the truck J and extending upwardly therefrom are spaced resilient posts or stops 266, 266 which serve to yieldably limit the downward movement of the cross bar 260. This construction is particularly adapted for use in department store billing. The bill 267 of a customer with two or three copies is printed simultaneously with individual order slips 268, that is to say, each item on the bill is printed on a number of slips located in rear of the bill. If a number of items on a bill are furnished by the same department such items are all printed on one set of individual order slips. These slips are generally wider than the bill as shown in Figure 40, and are held for line spacing, together with the bills, by the paper clamp or truck J. This margin is used for the purpose of printing the number of the bill on each set of order slips and thereby making it unnecessary to repeat the name and address of the customer with each item of the bill. The order slips are for distribution among the different departments for simultaneous execution of the order. In operation, after an item has been entered on the bill 267 and on the individual order slips 268, and the next item is to be furnished by a different department, the operator will make one line spacing operation by manipulating the operating lever 152. The operator will then turn the upper left hand corner of the several bills forwardly as shown in Figure 40, thereby rendering visible and accessible the individual order slips 268. The operator then places a finger against the completely written order slips 268 opposite the projecting plate 265. The operator then releases the paper clamp on the truck J with the other hand releasing all the sheets and pushes the individual order slips 268 and cross bar 260 upwardly until the posts 264 engage the upper cross bar 17. Meanwhile the truck J has gravitated to its lowest position without disturbing or moving the bills 267 from their last line spaced position. The operator then removes her hand from the cross bar 260 and the latter drops to its initial position resting on the rubber stops or bumpers 266. The paper clamp of the truck J is then reengaged to clamp the bills 267 and the order slips 268 and the next item on the bill 267 and individual order slips will be ready for writing. The length of travel of the cross bar 260 from its lowest position to its highest position is exactly the length of an individual order slip. The distance the cross bar 260 is moved to its upper stops equals the total travel minus the line spacing that has been done when writing the forms.

As illustrated in Figures 44, 45, 46 and 47, I have provided a cutout device for the purpose of preventing printed matter appearing on certain portions of certain of the work sheets. Attached to the end plates 10 and 11 of the carriage are guide plates 269, 269 which extend slightly forward of the work sheets H and are disposed below the longitudinal axis of the platen C. Each plate is provided with an opening or seat 270 which is disposed in alinement with the work sheets H as shown in Figure 46. These seats 270 are formed with forwardly extending inlet openings 271. Slidably mounted in the seats 270 is a plurality of relatively long and narrow metallic strips 272, 273 and 274, and rigidly mounted on the strips and projecting upwardly therefrom are shields 275, 276 and 277. The length of a shield is determined by the length of the line it is desired to cut out, but the maximum length should not be greater than the space left between the work sheets and the end plates of the carriage. It is obvious that a greater length would not clear the writing line when the shield is not in use. It is to be noted that the narrower the form or work sheet, the longer the permissible shield. Rigidly connected to the end plates of the carriage at points below the seats 270 are supporting rods 278 and 279 which are respectively provided with upstanding brackets 280 and 281. Fixed to the brackets 280 and 281 are socket members 282 and 283 respectively. These socket members open inwardly toward the end plates of the carriage for receiving the opposite ends of the strips 272, 273 and 274. The ends of the strips 272 are provided with laterally extend-

ing buttons 284, 284, the ends of the strips 273 are provided with heads 285, 285 of greater diameters than the buttons 284, and the ends of the strips 274 are provided with buttons 286, 286. The buttons 284 project forwardly whereas the buttons 286 project rearwardly. The strips are of equal length and the socket members 282 and 283 are of a sufficient size to receive the adjacent ends of said strips. The strips are considerably shorter than the distance between the socket members 282 and 283 and consequently these strips may be moved from right to left or left to right depending upon the location of the printed matter desired to be cut out.

In operation if writing in a column on the right hand side of some of the work sheets is to be prevented or cut out, the work sheets are inserted on the left hand side of the machine and the shield withdrawn to the right if it is not wanted and inserted from there whenever it is desired. If written matter is to be cut out on the left hand side of some of the work sheets, the work sheets are inserted on the right hand side of the machine and the shield withdrawn to the left and inserted from there whenever desired. If on some of the work sheets it is desired to avoid printing on the right hand side and others on the left hand side, the work sheets are inserted in the center of the machine and the shields are withdrawn and inserted from their respective sides. By providing the strips with the buttons 284 and 286 and the heads 285, I provide means for easily permitting the operator to separately engage each strip when it is desired to move the same. These buttons and heads also serve as stops in conjunction with the guide plates 269 to thereby determine the movement of the strips in one direction. It will therefore be apparent that the shields are sidewise slidable from right to left and vice versa for the purpose of bringing said shields in front of the space to be cut out or to remove it so as to permit unobstructed writing. It will also be understood that the shield is interposed between the work sheet and the carbon strip and therefore the shield prevents printing directly in back of it, but the shield is made sufficiently thin so as not to interfere with the printing of carbon copies in rear of the particular work sheet to be cut out.

In Figures 48 and 49, I have illustrated a modified form of cutout device. In this form, I have provided three strips 287, 288 and 289 to each of which is rigidly attached a screen 290. The strips 287 and 288 are of the same length whereas the strip 289 is longer and has its ends extending beyond the ends of the first two strips 287 and 288. Attached to the projecting ends of the strips 289 are clamping screws 291, 291, each screw including a head 292, a threaded shank 293, and an intermediate shoulder 294. The ends of the strips 287 and 288 are disposed between the strip 289 and the heads 292 of the clamping screws. One end of the strip 289 extends beyond the associated screw as at 295 and the extreme end thereof is provided with a button 296. This form of cutout device is especially adapted for use with forms or work sheets which require the cutting out of identical written matter on a number of sheets. By the construction disclosed all three strips and their attached shield 290 may be moved longitudinally as a unit. The button 296 is engaged by the hand of the operator whenever it is desired to slide this unit assembly. In this form of cutout device, the supporting arms 278, 279, brackets 280 and 281, and the socket members 282 and 283 are not employed.

The intermittent feeding device 217 for the carbon strips K is actuated by the manually operable lever 152 simultaneously with the backward movement of the platen C and the operation of the carbon strip tensioning device 218, but prior to the line spacing movement of the truck J. To this end, the channel bracket 216 includes a bottom wall 297, a top wall 298, and a connecting wall 299. Located at the rear end of the bracket is a positive feed roll 300 which is formed with a series of corrugations 301 on its periphery. The roll is journaled in the top and bottom walls of the bracket 216, and fixed to the lower bearing pin 302 of the roll below the bottom wall is a ratchet wheel 303. A bell crank lever 304 is fulcrumed at its angle to the bearing pin 302 and carried by one arm 305 of said lever is a spring pawl 306 which yieldably engages the teeth on the ratchet wheel, as shown in Figure 20. A spring back dog 307 is mounted on the bottom wall 297 of the bracket 216 and cooperates with the teeth of the ratchet wheel to prevent backward rotation thereof. Cooperating with the positive feed roll 300 is an idle feed roll 308 having similar corrugations 309 in its periphery. The idle feed roll 308 is provided with upper and lower bearing pins 310 and 311. A substantially U-shaped frame 312 embraces the rear end of the bracket 216 and this frame includes a bottom 313, an outer end wall 314, an inner end wall 315, a top section 316 which extends outwardly from the inner wall, and a top section 317 which extends inwardly from the outer wall. The bearing pins 310 and 311 of the idle feed roll 308 are journaled in the bottom 313 and top section 317. The lower bearing pin 311 passes downwardly through a transverse slot 318 formed in the bottom 297 of the bracket 216, and the bearing pin 302 of the positive feed roll 300 passes through a transverse slot 319 formed in the bottom 313 of the frame 312. By means of the bearing pins 302 and 311 of the feed rolls passing downwardly through the transverse slots 318 and 319, the frame 312 is capable of being bodily

moved in a plane transverse to the longitudinal axis of the bracket 216 and thereby permit the idle roll 308 to be moved into and out of engagement with the positive feed roll 300. The idle roll 308 is yieldably held in operative engagement with the positive feed roll 300 by means of a coil spring 320 which is disposed between the left hand end wall 315 of the frame 312 and a boxing 321 which is attached to the vertical wall 299 of the bracket 216. A cam shaft 322 is disposed within the boxing 321 and has its upper and lower ends respectively journaled in the bottom 313 and top 316 of the movable frame 312. This shaft 322 is provided with a recess 323 which extends for the full distance between the bottom 313 and top 316 of said frame 312. The cam shaft 322 is provided with an operating handle 324. Thus in the normal position of the feed rolls the carbon strips K are disposed therebetween and securely clamped by the interfitting corrugations of said rolls. When, however, it is desired to move the idle roll 308 out of operative engagement with the positive roll 300, the cam shaft 322 is turned by the operating handle 324 to the position shown in Figure 19, which, by reason of the shaft being journaled in the frame 312, causes said frame to be moved toward the right as shown in said figure thereby operating the feed rolls. After the carbon strips K have been positioned between the rolls, the operator swings the cam shaft 322 in the reverse direction, and the recesses 311 and 319 permit the crank shaft together with the frame 312 to be bodily moved to the left under the influence of the spring 320. In order to actuate the positive feed roll 300 by the manually operable lever 152, I have provided the lever 31 which is fixed to the rock shaft 29 with a downwardly extending arm 325 carrying a roller 326. A bell crank lever 327 is provided with arms 328 and 329, the former being formed with a forked end 330 which slidably engages the roller 326. The arms are connected by a saddle-like angle portion 331 so as to permit the arms to straddle the end plate 11 of the carriage, the arm 329 being pivoted to said plate as at 332. A link 333 is connected at its forward end to the arm 329 and at its rear end to the arm 334 of the bell crank lever 304 which actuates the ratchet wheel 303. It will thus be seen that when the collating frame G is rocked forwardly upon movement of the manually operable lever 152, the lever 31 will be rocked and the ratchet wheel 303 will be moved and the carbon strips K will be fed.

In operation the lead-in ends of the work sheets H are drawn over the roller 63, thence along the edge guides 57 and 58 of the paper table I, thence under the rollers 83 and above the roller 48, thence downwardly under the lower guide roll 49, and thence upwardly past the platen C. The lead-in ends of the work sheets are not at this time clamped to the truck J. The carbon strips K are then led around the guide fingers 212 and thence forwardly through the tension plates 222 of the strip tensioning device 207, thence forwardly around the front guide 214, after which the strips are interleaved with the work sheets, thence around the guide roll 215 at the front right hand corner of the carriage, and thence rearwardly to the strip feeding means 217 in which the free ends of the strips are operatively engaged between the corrugated feed rolls 300 and 308. The operating handle 131 of the truck J is then actuated so as to move the front or movable clamping plate y forwardly and the lead-in ends are then inserted in said truck. It will be observed that the clamp is now open and consequently the work sheets may be drawn upwardly through the truck, and while the work sheets are thus held against downward movement by one hand of the operator, the other hand of the operator may engage the finger pieces 142, 143 and release the truck from the line spacing means thereby permitting the truck to gravitate onto the platen C. The work sheets as previously stated are usually made up of connected forms and the upper edge of the lead-in form is then positioned against the forwardly extending flange 151 of the end gage 144 which is mounted at the top of the collating frame. This gage determines the proper writing position for te next form. The first form is then torn off, and the work sheets are clamped to the truck J by the operator engaging the hand lever 130 and thereby returning the movable clamping plate y to its normal or clamping position. The operator then proceeds to write the first line on the form. The operator then swings the carriage return lever 152 to the right which swings the collating frame forwardly and the platen rearwardly thereby relieving the tight contact relation which previously existed between the work sheets, carbon strips and the platen. Simultaneously with the rearward movement of the platen, the carbon strip tensioning device 218 is actuated to apply a gradually increased tension to said strips, and simultaneously with the application of this tension the carbon strip feeding means 217 is actuated whereby the strips are fed through the tensioning device while a gradually increased tension is being applied to said strips. After these operations have been performed, the operator continues to swing the carriage return lever 152 in the same direction and consequently a line spacing movement is imparted to the truck J and thus to the work sheets H. The operator upon continued pressure on the carriage return lever 152 causes the carriage to be returned to its original writing position, and upon release of said lever, the same will return to its initial po-

sition, the collating frame will return to its original rearwardly inclined position, the tension on the carbon strips will be reduced to the original minimum amount and the feed pawl 306 of the strip feeding means rides backwardly over the teeth of the ratchet wheel to a position in readiness for the next feeding movement thereof. The above writing and line spacing operations are repeated as often as desired and when a given form has been completed, the clamp of the work truck is opened and permitted to gravitate onto the platen C, the operator holding the written form with her hand against dropping with the truck. The clamp of the truck is then closed so as to clamp the next form to the truck, and the previously printed form is then torn off.

The clamps 27, 27 permit rotative adjustment of the platen C for the purpose of presenting new writing surfaces, and the slots 26 form resultant spring ends to the platen for assisting the same to be clamped to the heads 24.

I claim:—

1. In a manifolding device, the combination with a platen past which work sheets are fed and which sheets tightly and compactly engage said platen prior to and during printing intervals; of means for supporting a carbon strip interleaved with said work sheets; and means for first bodily moving the platen rearwardly to relieve said tight contact relation and to feed the carbon strip, and to thereafter effect a line spacing movement to the work sheets while the platen is in its rearwardly moved position.

2. In a manifolding device, the combination with a platen past which work sheets are fed and which sheets tightly and compactly engage said platen prior to and during printing intervals; of means for supporting a carbon strip interleaved with said work sheets; and means for first bodily moving the platen rearwardly to separate the platen from the work sheets and the interleaved carbon strip and to feed the carbon strip, and to thereafter effect a line spacing movement to the work sheets while the platen is in its rearwardly moved position.

3. In a manifolding device, the combination with a platen past which work sheets are fed and which sheets tightly and compactly engage said platen prior to and during printing intervals; of means for supporting a carbon strip interleaved with said work sheets; and means including a single manually operable lever for first bodily moving the platen rearwardly to relieve said tight contact relation and to feed the carbon strip, and to thereafter effect a line spacing movement to the work sheets while the platen is in its rearwardly moved position.

4. In a manifolding device, the combination with a platen past which work sheets are fed and which sheets tightly and compactly engage said platen prior to and during printing intervals; of means for supporting a carbon strip interleaved with said work sheets; and means including a single manually operable lever for first bodily moving the platen rearwardly to separate the platen from the work sheets and the interleaved carbon strip and to feed the carbon strip, and to thereafter effect a line spacing movement to the work sheets while the platen is in its rearwardly moved position.

5. In a manifolding device, the combination with a platen past which work sheets are fed and which sheets tightly and compactly engage said platen prior to and during printing intervals; of means for supporting a carbon strip interleaved with said work sheets; strip feeding means located on one side of the work sheets; a strip tension means located on the other side of the work sheets; and means for first bodily moving the platen rearwardly to relieve said tight contact relation and to simultaneously actuate the strip tension means and the strip feeding means, and to thereafter effect a line spacing movement to the work sheets while the platen is in its rearwardly moved position.

6. In a manifolding device, the combination with a platen past which work sheets are fed and which sheets tightly and compactly engage said platen prior to and during printing intervals; of means for supporting a carbon strip interleaved with said work sheets; strip feeding means located on one side of the work sheets; a strip tension means located on the other side of the work sheets and normally applying minimum tension on said strip; and means including a single manually operable lever for first bodily moving the platen rearwardly to separate the platen from the work sheets and the interleaved carbon strip and to simultaneously actuate the strip tension means to gradually increase the tension thereof and to concurrently actuate the strip feeding means, and to thereafter effect a line spacing movement to the work sheets while maximum tension is maintained on the carbon strip and while the platen is in its rearwardly moved position.

7. In a manifolding device, the combination with a platen past which work sheets are fed and which sheets tightly and compactly engage said platen prior to and during printing intervals; of means for supporting a carbon strip interleaved with said work sheets; strip feeding means located on one side of the work sheets; a strip tension means located on the other side of the work sheets and normally applying minimum tension on said strip; and means for first bodily moving the platen rearwardly to relieve said tight contact relation and to simultaneously actuate the strip tension means to gradually increase the tension thereof and concur-

rently actuate the strip feeding means, and to thereafter effect a line spacing movement to the work sheets while maximum tension is maintained on the carbon strip and while the platen is in its rearwardly moved position.

8. In a manifolding device, the combination with a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals; of a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheets thereto; means for supporting a carbon strip interleaved with the work sheets; and means for first bodily moving the platen rearwardly to relieve said tight contact relation and to feed the carbon strip, and to thereafter effect a line spacing movement to said truck while the platen is in its rearwardly moved position.

9. In a manifolding device, the combination with a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals; of a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheets thereto; means for supporting a carbon strip interleaved with the work sheets; and means including a single manually operable lever for first bodily moving the platen rearwardly to relieve said tight contact relation and to feed the carbon strip, and to thereafter effect a line spacing movement to said truck while the platen is in its rearwardly moved position.

10. In a manifolding device, the combination with a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals; of a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheets thereto; means for supporting a carbon strip interleaved with the work sheets; and means including a single manually operable lever for first bodily moving the platen rearwardly to separate the platen from the work sheets and interleaved carbon strip and to feed the carbon strip, and to thereafter effect a line spacing movement to said truck while the platen is in its rearwardly moved position.

11. In a manifolding device, the combination with a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals; of a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheets thereto; means for supporting a carbon strip interleaved with the work sheets; strip feeding means located at one side of the work sheets; a strip tension means located on the other side of the work sheets; and means for first bodily moving the platen rearwardly to relieve said tight contact relation and to simultaneously actuate the strip feeding means and the strip tension means, and to thereafter effect a line spacing movement to the truck while the platen is in its rearwardly moved position.

12. In a manifolding device, the combination with a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals; of a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheets thereto; means for supporting a carbon strip interleaved with the work sheets; strip feeding means located at one side of the work sheets; a strip tension means located on the other side of the work sheets; and means including a single manually operable lever for first bodily moving the platen rearwardly to relieve said tight contact relation and to simultaneously actuate the strip feeding means and the strip tension means, and to thereafter effect a line spacing movement to the truck while the platen is in its rearwardly moved position.

13. In a manifolding device, the combination with a travelling carriage; of a collating frame pivoted on said carriage and normally inclined rearwardly; a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals, said platen being fixed to the frame to move rearwardly when the frame is swung forwardly; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheets thereto; means for supporting a carbon strip interleaved with said work sheets; and means for first swinging the collating frame forwardly and the platen rearwardly to relieve said tight contact relation and to feed the carbon strip, and to thereafter effect a line spacing movement to the truck while the platen is in its rearwardly moved position.

14. In a manifolding device, the combination with a travelling carriage; of a collating frame pivoted on said carriage and normally inclined rearwardly; a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals, said platen being fixed to the frame to move rear-

wardly when the frame is swung forwardly; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheets thereto; means for supporting a carbon strip interleaved with said work sheets; strip feeding means located at one side of the work sheets; a strip tension means located at the other side of the work sheets; and means for first swinging the collating frame forwardly and the platen rearwardly to relieve said tight contact relation and to simultaneously actuate the strip feeding means and the strip tension means, and to thereafter effect a line spacing movement to the truck while the platen is in its rearwardly moved position.

15. In a manifolding device, the combination with a travelling carriage; of a collating frame pivoted on said carriage and normally inclined rearwardly; a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals, said platen being fixed to the frame to move rearwardly when the frame is swung forwardly; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheets thereto; means for supporting a carbon strip interleaved with said work sheets; strip feeding means located at one side of the work sheets; a rock shaft; connections between the collating frame, the strip feeding means, and the rock shaft; and means for first swinging the collating frame forwardly and the platen rearwardly to relieve said tight contact relation and to simultaneously actuate the strip feeding means, and to thereafter effect a line spacing movement to the truck while the platen is in its rearwardly moved position, said means including a manually operable cam lever and connections between the cam lever and the rock shaft.

16. In a manifolding device, the combination with a travelling carriage; of a collating frame pivoted on said carriage and normally inclined rearwardly; a platen past which work sheets are fed and which work sheets tightly and compactly engage said platen prior to and during printing intervals, said platen being fixed to the frame to move rearwardly when the frame is swung forwardly; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the work sheet thereto; means for supporting a carbon strip interleaved with said work sheets; strip feeding means located at one side of the work sheets; a strip tension means located at the other side of the work sheets; a rock shaft; connections between the collating frame, the strip feeding means, and the rock shaft; and means for first swinging the collating frame forwardly and the platen rearwardly to relieve said tight contact relation and to simultaneously actuate the strip feeding means, and to thereafter effect a line spacing movement to the truck while the platen is in its rearwardly moved position, said means including a manually operable cam lever and connections between the cam lever and the rock shaft and other connections between the cam lever and the strip tension means.

17. In a manifolding device, the combination with a typewriting machine including a main frame, and a carriage movable therealong and including a platen; of means for positioning a plurality of work sheets in cooperative relation with said platen; a spindle rigidly attached to the main frame and projecting rearwardly therefrom; a plurality of spools of carbon strips rotatably mounted on said spindle; separating discs between the spools supported on the spindle and having non-rotative connections with the latter; and means on the carriage to guide the carbon strips delivered from the spools in interleaved relation with said work sheets and along the printing line of the platen.

18. In a manifolding device, the combination with a typewriting machine including a main frame, and a carriage movable therealong and including a platen; of means for positioning a plurality of work sheets in cooperative relation with said platen; a spindle rigidly attached to the main frame and projecting rearwardly therefrom; said spindle being formed with a plurality of spaced grooves; a plurality of spools of carbon strips rotatably mounted on said spindle between the grooves; separating discs between the spools supported on the spindle and having interlocking connections with the grooves of the spindle; and means on the carriage to guide the carbon strips delivered from the spools in interleaved relation with said work sheets and along the printing line of the platen.

19. In a manifolding device, the combination with a typewriting machine including a main frame, and a carriage movable therealong and including a platen; of means for positioning a plurality of work sheets in cooperative relation with said platen; a spindle rigidly attached to the main frame and projecting rearwardly therefrom; said spindle being formed with a plurality of spaced grooves; a plurality of spools of carbon strips rotatably mounted on said spindle between the grooves; separating discs between the spools supported on the spindle, said discs being respectively formed with eccentric openings for receiving the spindle and the openings being formed with concentric portions engageable in the grooves of the spindle to retain the discs against longitudinal and rotary movements relative to the spindle; and means on the carriage to guide the carbon strips delivered from the spools in interleaved

relation with said work sheets and along the printing line of the platen.

20. In a manifolding device, the combination with a typewriting machine including a main frame, and a carriage movable therealong and including a platen; of means for positioning a plurality of work sheets in cooperative relation with said platen; a spindle rigidly attached to the main frame and projecting rearwardly therefrom; a plurality of spools of carbon strips rotatably mounted on said spindle; separating discs between the spools supported on the spindle and having non-rotative connections with the latter, said discs being respectively provided with guard fingers extending laterally from the peripheries thereof over the respective carbon strip spools; and means on the carriage to guide the carbon strips delivered from the spools in interleaved relation with said work sheets and along the printing line of the platen.

21. In a manifolding device, the combination with a typewriting machine including a main frame, and a carriage movable therealong and including a platen; of means for positioning a plurality of work sheets in cooperative relation with said platen; a plurality of carbon strip spools located in rear of the machine and supported for rotation about a horizontal axis on the main frame; and means at one side of the work sheets for guiding the carbon strips from the spools to said sheets, said guiding means including a single front guide and a plurality of alined rear guides, each rear guide including a vertical guide finger and an overhanging guard finger.

22. In a manifolding device, the combination with a typewriting machine including a carriage having a platen; of means for directing a plurality of work sheets past the platen; a plurality of carbon strips interleaved with said work sheets; a feeding device for the carbon strips including a pair of cooperating feed rolls; and means for intermittently rotating said rolls including a ratchet wheel directly connected to one of said rolls, a bell crank lever, connections between one arm of the bell crank lever and the ratchet wheel for actuating the latter upon movement of the former, a rock shaft journaled on the carriage, a lever fixed to the rock shaft and having a sliding pivotal connection with the other arm of the bell crank lever, and means for rocking said shaft.

23. In a manifolding device, the combination with a typewriting machine including a carriage having end plates and a platen; of means for directing a plurality of work sheets past the plate; a plurality of carbon strips interleaved with said work sheets; a feeding device for the carbon strips including a pair of cooperating feed rolls located adjacent one end plate of the carriage; and means for intermittently rotating said rolls including a ratchet wheel directly connected to one of said rolls, a bell crank lever fulcrumed on the adjacent end plate of the carriage, connections between one arm of the bell crank lever and the ratchet wheel for actuating the latter upon movement of the former, a rock shaft journaled on the carriage, a lever fixed to the rock shaft and having a sliding pivotal connection with the other arm of the bell crank lever, and means for rocking said shaft.

24. In a manifolding device, the combination with a platen past which work sheets are fed; means for supporting carbon strips in interleaved relation with said work sheets; means located at one side of the sheets for feeding the strips; and a tension device located at the other side of the sheets and comprising a plurality of freely supported tension plates between which the strips are arranged, a yieldable stop disposed against one of the outer tension plates, and means cooperating with the other outer tension plate for directing all of said plates against said yieldable stop.

25. In a manifolding device, the combination with a platen past which work sheets are fed; means for supporting carbon strips in interleaved relation with said work sheets; means located at one side of the sheets for feeding the strips; and a tension device located at the other side of the sheets and comprising a plurality of freely supported tension plates between which the strips are arranged, a yieldable stop disposed against one of the outer tension plates, means for adjusting said yieldable stop, and means cooperating with the other outer tension plate for directing all of said plates against said yieldable stop.

26. In a manifolding device, the combination with a platen past which work sheets are fed; means for supporting carbon strips in interleaved relation with said work sheets; means located at one side of the sheets for feeding the strips; and a tension device located at the other side of the sheets and comprising a plurality of freely supported tension plates between which the strips are arranged, a yieldable stop disposed against one of the outer tension plates, means cooperating with the other outer tension plate for directing all of said plates against said yieldable stop; and a single manually operable lever for simultaneously actuating said strip feeding means and for actuating the strip tension means.

27. In a manifolding device, the combination with a platen past which work sheets are fed; means for supporting carbon strips in interleaved relation with said work sheets; means located at one side of the sheets for feeding the strips; and a tension device located at the other side of the sheets and comprising a plurality of freely supported tension plates between which the strips are arranged,

said tension plates progressively increasing in height, a yieldable stop disposed against one of the outer tension plates, and means cooperating with the other outer tension plate for directing all of said plates against said yieldable stop.

28. In a manifolding device, the combination with a platen past which work sheets are fed; means for supporting carbon strips in interleaved relation with said work sheets; means located at one side of the sheets for feeding the strips; and a tension device located at the other side of the sheets and comprising a plurality of freely supported tension plates between which the strips are arranged, a bell crank lever fulcrumed adjacent one of the outer tension plates, a spring for normally urging the bell crank lever toward said outer tension plate, a stop for limiting the movement of the bell crank lever toward said outer tension plate, a yieldable stop mounted on the bell crank lever and engageable with said outer tension plate, and means cooperating with the other outer tension plate for directing all of said plates against said yieldable stop.

29. In a manifolding device, the combination with a platen past which work sheets are fed; means for supporting carbon strips in interleaved relation with said work sheets; means located at one side of the sheets for feeding the strips; and a tension device located at the other side of the sheets and comprising a plurality of freely supported tension plates between which the strips are arranged, a bell crank lever fulcrumed adjacent one of the outer tension plates, a spring for normally urging the bell crank lever toward said outer tension plate, a stop for limiting the movement of the bell crank lever toward said outer tension plate, a yieldable stop mounted on the bell crank lever and engageable with said outer tension plate, means cooperating with the other outer tension plate for directing all of said plates against said yieldable stop; and a single manually operable lever for simultaneously actuating said strip feeding means and for actuating the strip tension means.

30. In a manifolding device, the combination with a carriage having a platen; of means for directing a plurality of work sheets past the platen; means for supporting a plurality of carbons intermediate said work sheets; and a cutout device comprising guiding means mounted on the carriage on opposite sides of the work sheets and in a plane below the printing line of the platen, a relatively long and narrow strip slidably supported in said guides, and a shield fixed to said strip and movable therewith between a work sheet and the adjacent carbon from an operative to an inoperative position.

31. In a manifolding device, the combination with a carriage having a platen; of means for directing a plurality of work sheets past the platen; means for supporting a plurality of carbons intermediate said work sheets; and a cutout device comprising guiding means mounted on the carriage on opposite sides of the work sheets and in a plane below the printing line of the platen, a relatively long and narrow strip slidably supported in said guides, a shield fixed to said strip and movable therewith between a work sheet and the adjacent carbon from an operative to an inoperative position, arms rigidly connected to the opposite ends of the carriage, and socket members fixed to said arms and opening towards the carriage for alternately receiving the opposite ends of said strip.

32. In a manifolding device, the combination with a carriage having a platen; of means for directing a plurality of work sheets past the platen; means for supporting a plurality of carbons intermediate said work sheets; and a cutout device comprising guiding means mounted on the carriage on opposite sides of the work sheets and in a plane below the printing line of the platen, a plurality of relatively long and narrow strips slidably supported in said guides and provided at their ends with finger pieces for facilitating independent movement of said strips, and a shield fixed to each strip and movable therewith between a work sheet and the adjacent carbon from an operative to an inoperative position.

33. In a manifolding device, the combination with a carriage having a platen; of means for directing a plurality of work sheets past the platen; means for supporting a plurality of carbons intermediate said work sheets; and a cutout device comprising guiding means mounted on the carriage on opposite sides of the work sheets and in a plane below the printing line of the platen, three relatively long and narrow strips arranged side by side and slidably supported in said guides, the outer strips being respectively provided at their ends with outwardly projecting buttons forming finger pieces, and the intermediate strip being provided at its ends with heads having greater diameters than the buttons and forming finger pieces, and a shield fixed to each strip and movable therewith between a work sheet and the adjacent carbon from an operative to an inoperative position.

34. In a manifolding device, the combination with a carriage having a platen; of means for directing a plurality of work sheets past the platen; means for supporting a plurality of carbons intermediate said work sheets; and a cutout device comprising guiding means mounted on the carriage on opposite sides of the work sheets and in a plane below the printing line of the platen, three relatively long and narrow strips arranged

side by side and slidably supported in said guides, the outer strips being respectively provided at their ends with outwardly projecting buttons forming finger pieces, and the intermediate strip being provided at its ends with heads having greater diameters than the buttons and forming fingerpieces, a shield fixed to each strip and movable therewith between a work sheet and the adjacent carbon from an operative to an inoperative position, arms rigidly connected to the opposite ends of the carriage, and socket members fixed to said arms and opening towards the carriage for alternately receiving the opposite ends of said strips.

35. In a manifolding device, the combination with a carriage having a platen; of means for directing a plurality of work sheets past the platen; means for supporting a plurality of carbons intermediate said work sheets; and a cutout device comprising guiding means mounted on the carriage on opposite sides of the work sheets and in a plane below the printing line of the platen, a plurality of relatively long and narrow strips slidably supported in said guides and arranged side by side, one of the outer strips being longer than the others and provided adjacent its ends with clamping bolts for receiving the ends of the other strips whereby all of said strips may be moved as a unit, and a shield fixed to each strip and movable therewith between a work sheet and the adjacent carbon from an operative to an inoperative position.

36. In a manifolding device, the combination with a platen; of means for directing two sets of work sheets of relatively different widths past the platen; means for supporting carbon strips interleaved with said work sheets; a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the front set of work sheets; means for imparting line space movements to the truck; and a cross bar mounted on the frame for vertical movements independent of the truck and against which the operator may clamp the rear set of work sheets to facilitate the stripping thereof from the carbon strips.

37. In a manifolding device, the combination with a platen; of means for directing two sets of work sheets of relatively different widths past the platen; means for supporting carbon strips interleaved with said work sheets; a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the front set of work sheets; means for imparting line space movements to the truck; a cross bar mounted on the frame for vertical movements independent of the truck and against which the operator may clamp the rear set of work sheets to facilitate the stripping thereof from the carbon strips; and cooperating means between the frame and the cross bar for preventing binding of the latter during its vertical movements.

38. In a manifolding device, the combination with a platen; of means for directing two sets of work sheets of relatively different widths past the platen; means for supporting carbon strips interleaved with said work sheets; a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the front set of work sheets; means for imparting line space movements to the truck; a cross bar mounted on the frame for vertical movements independent of the truck and against which the operator may clamp the rear set of work sheets to facilitate the stripping thereof from the carbon strips; and cooperating means between the frame and the cross bar for preventing binding of the latter during its vertical movements, said cooperating means including vertically disposed spaced rack bars fixed to the collating frame, a shaft journaled on the cross bar, and gears fixed to the shaft and meshing with the teeth of said rack bars.

39. In a manifolding device, the combination with a platen; of means for directing two sets of work sheets of relatively different widths past the platen; means for supporting carbon strips interleaved with said work sheets; a collating frame over which the work sheets are moved after leaving the platen; a truck mounted on the frame for vertical movements and having means for clamping the lead-in ends of the front set of work sheets; means for imparting line space movements to the truck; a cross bar mounted on the frame for vertical movements independent of said truck; and a fingerpiece rigidly secured to the cross bar and projecting forwardly thereof and against which the operator may clamp the rear set of work sheets to facilitate the stripping thereof from the carbon strips.

In testimony whereof, I have hereunto subscribed my name.

GUSTAVE O. DEGENER.