

Feb. 6, 1940.

A. W. MILLS

2,189,043

PRINTING TRANSFERRING MACHINE

Filed Nov. 5, 1938

8 Sheets-Sheet 1

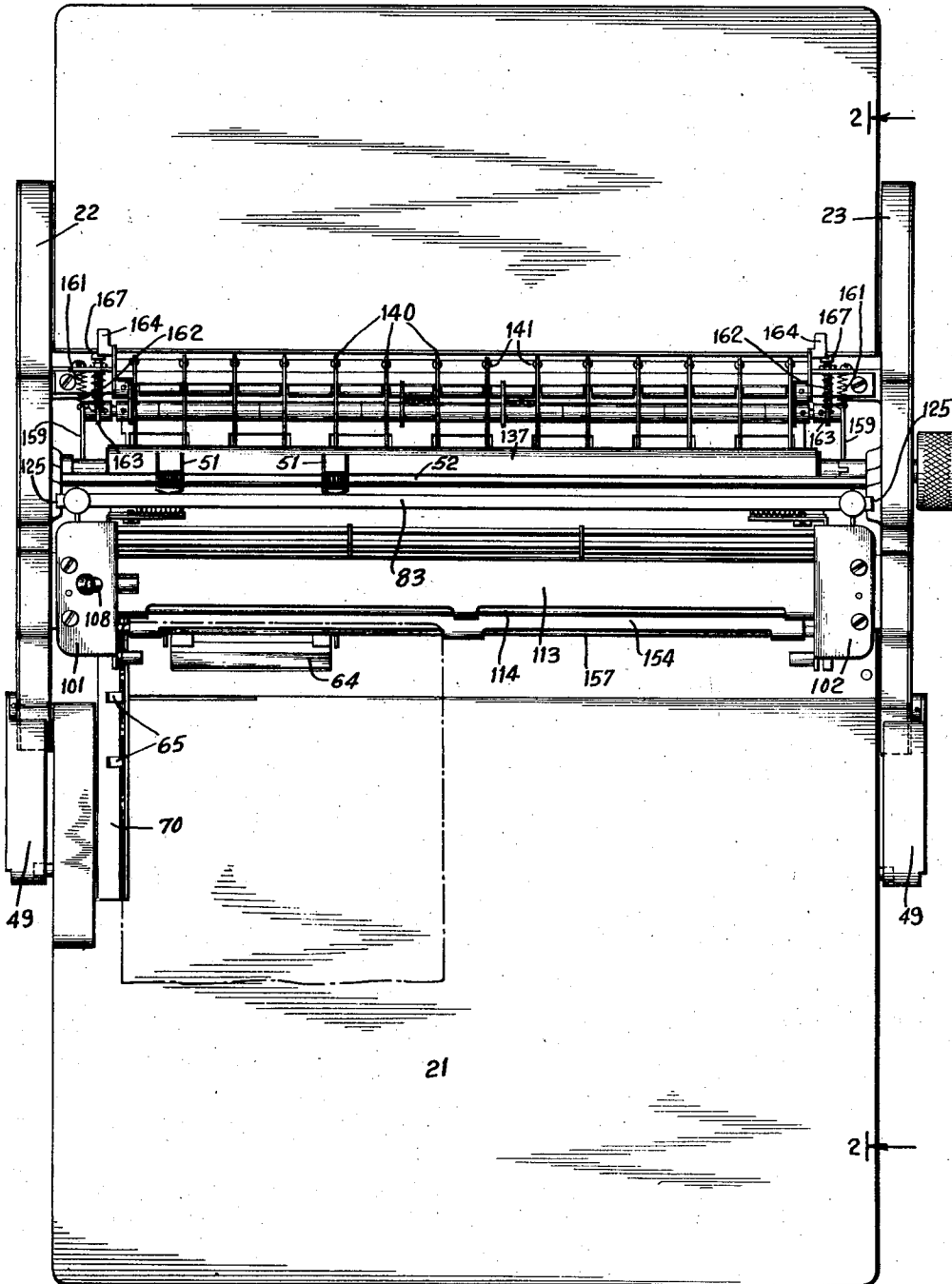


FIG. 1.

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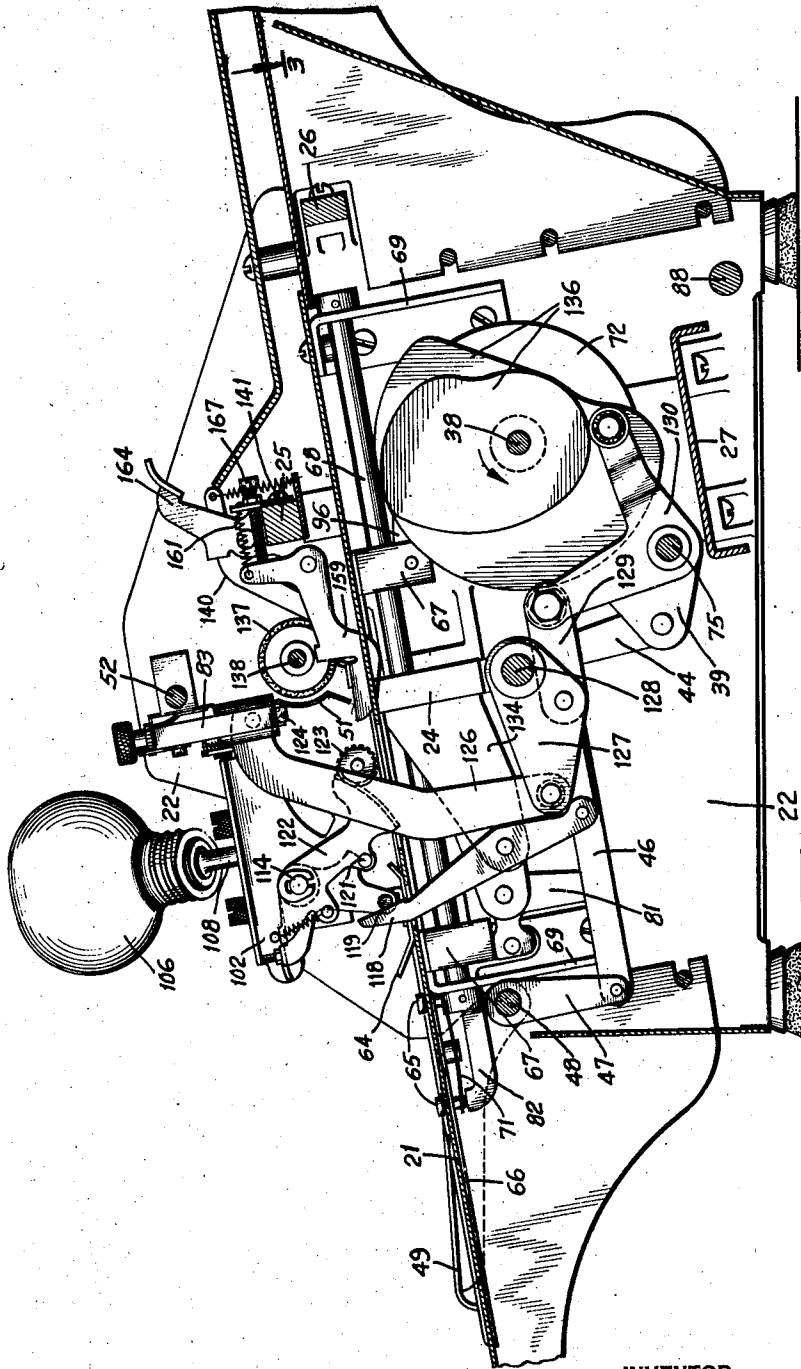
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8 Sheets-Sheet 2

FIG. 2.



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8 Sheets-Sheet 3

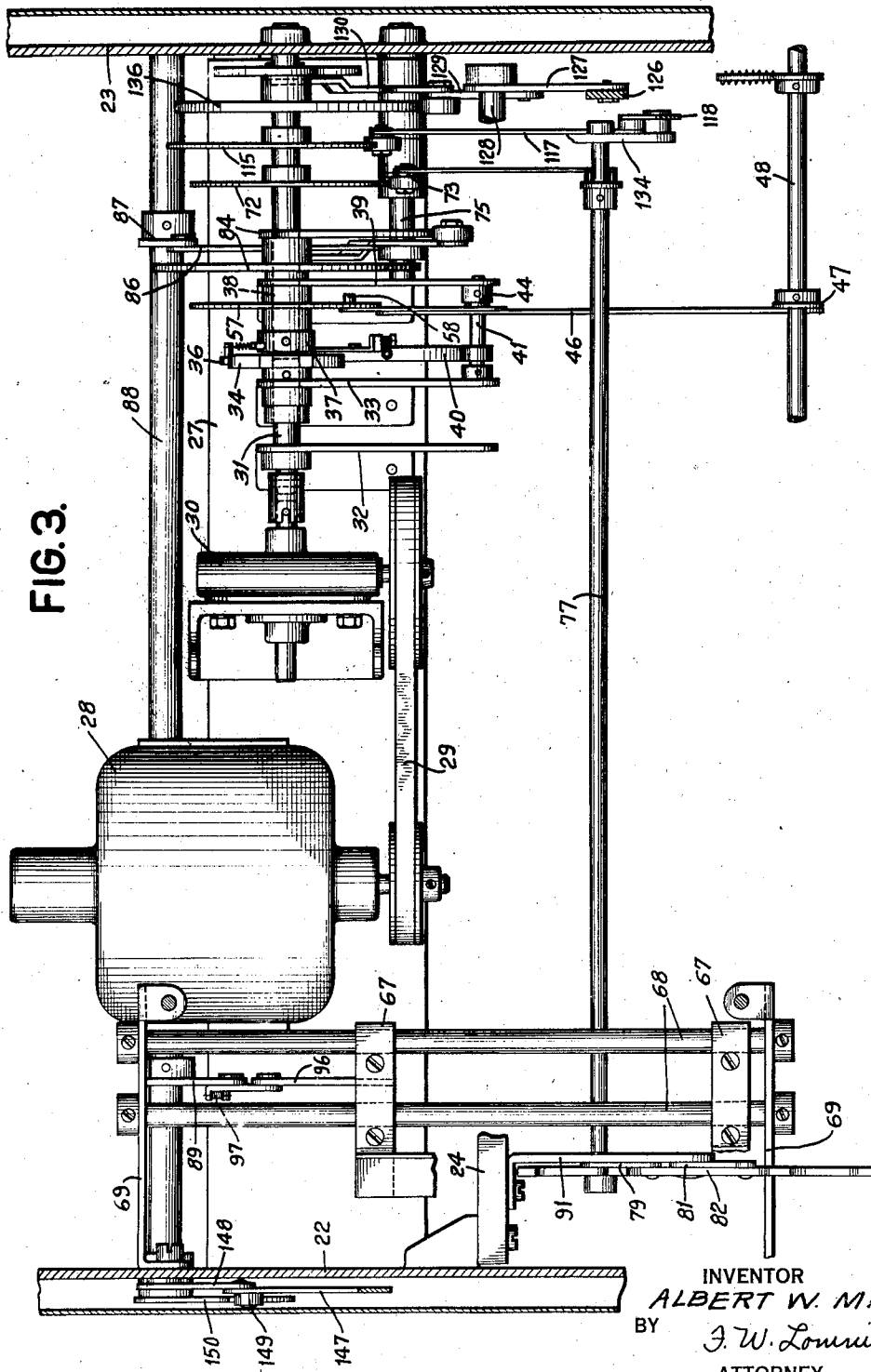


FIG. 3.

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8 Sheets-Sheet 4

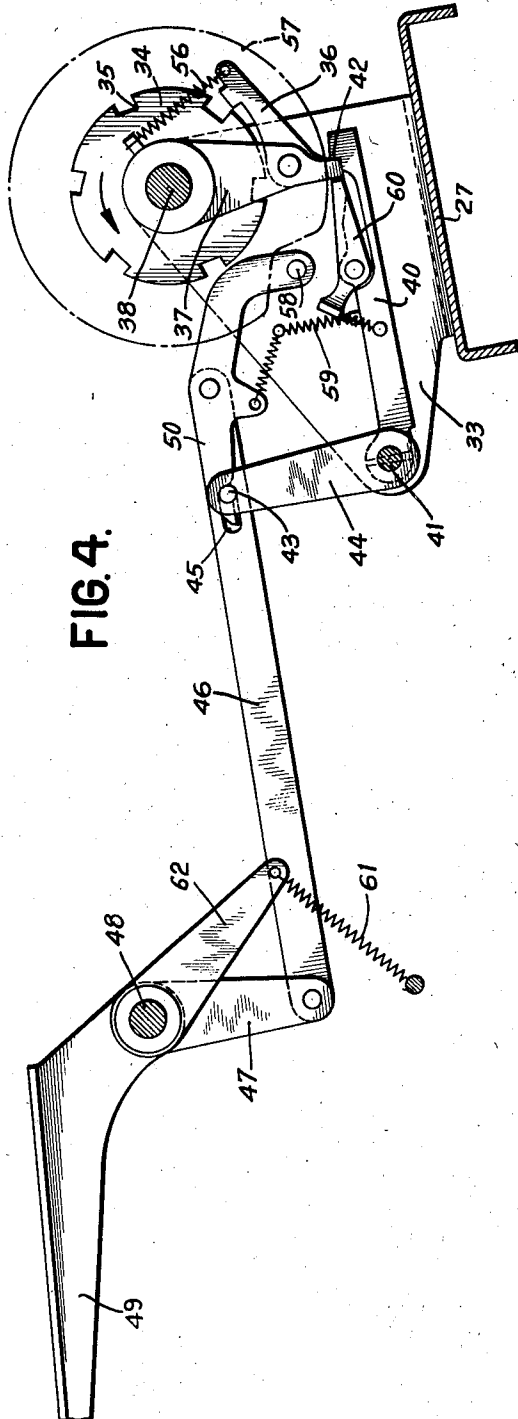


FIG. 4.

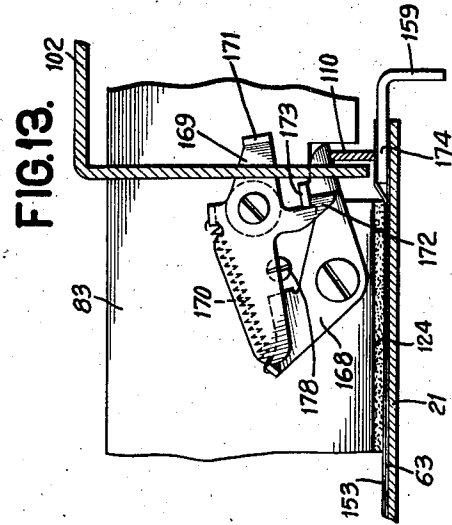


FIG. 13.

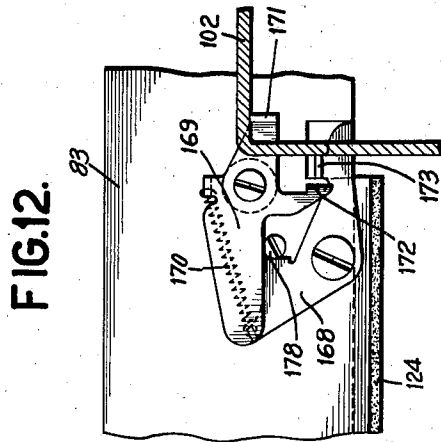


FIG. 12.

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PRINTING TRANSFERRING MACHINE

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8 Sheets-Sheet 6

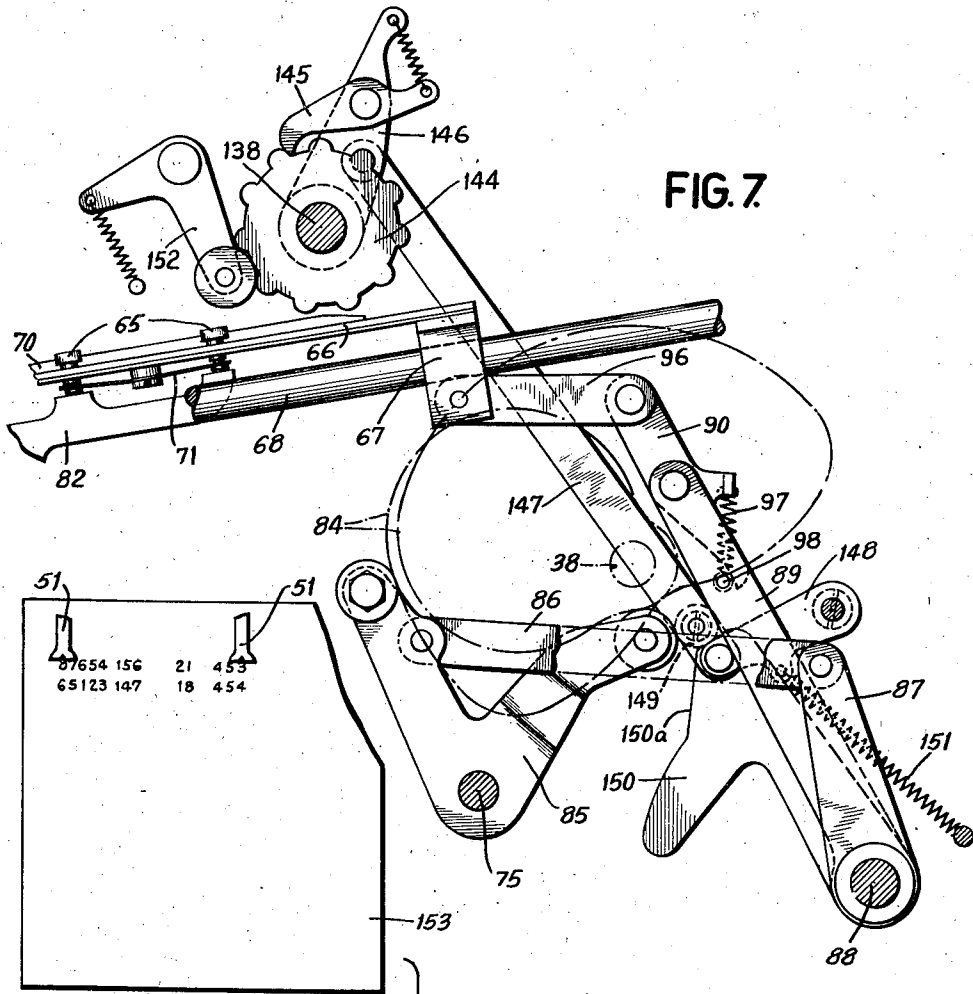


FIG. 7.

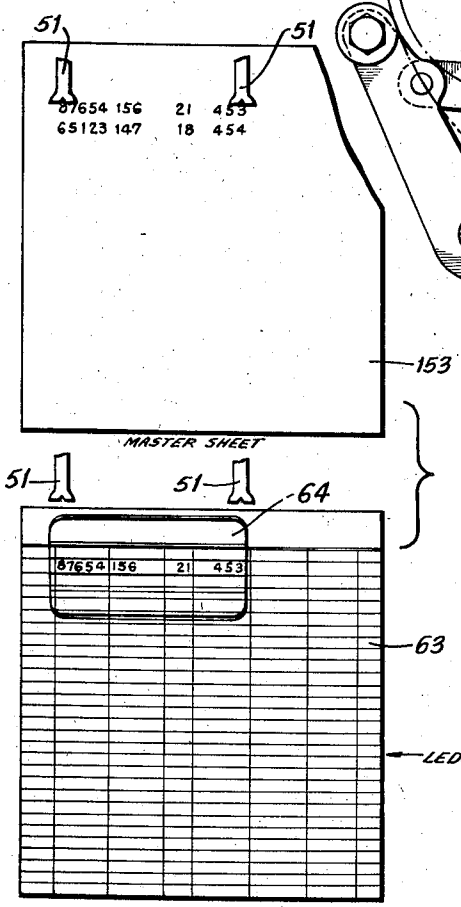


FIG. 14.

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PRINTING TRANSFERRING MACHINE

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8 Sheets-Sheet 7

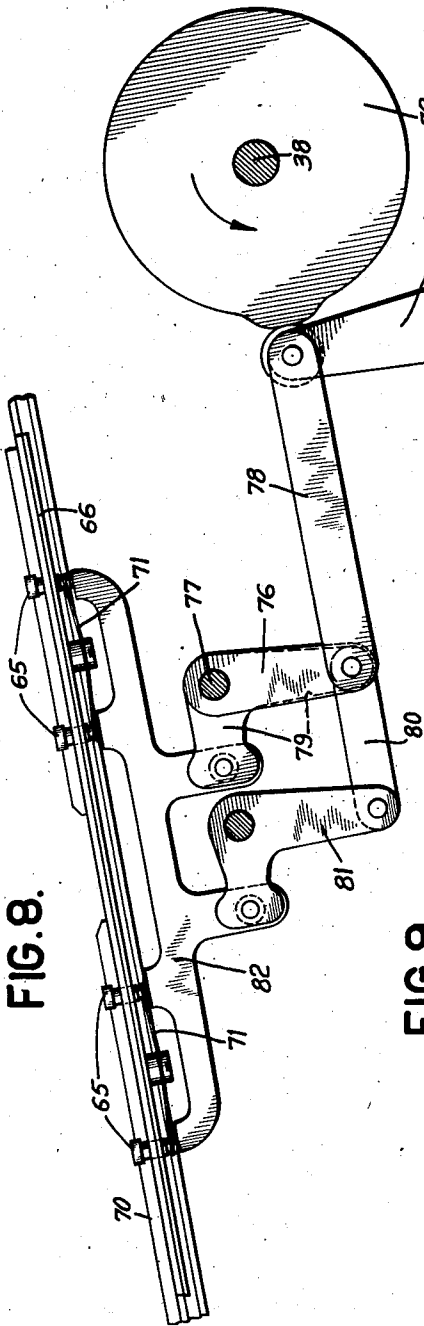


FIG. 8.

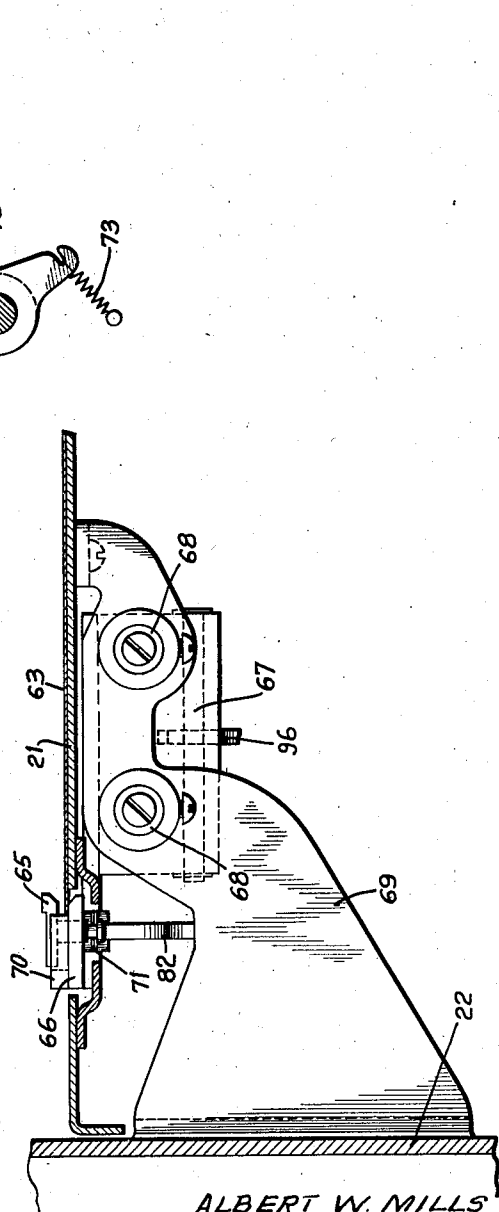


FIG. 9.

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PRINTING TRANSFERRING MACHINE

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8 Sheets—Sheet 8

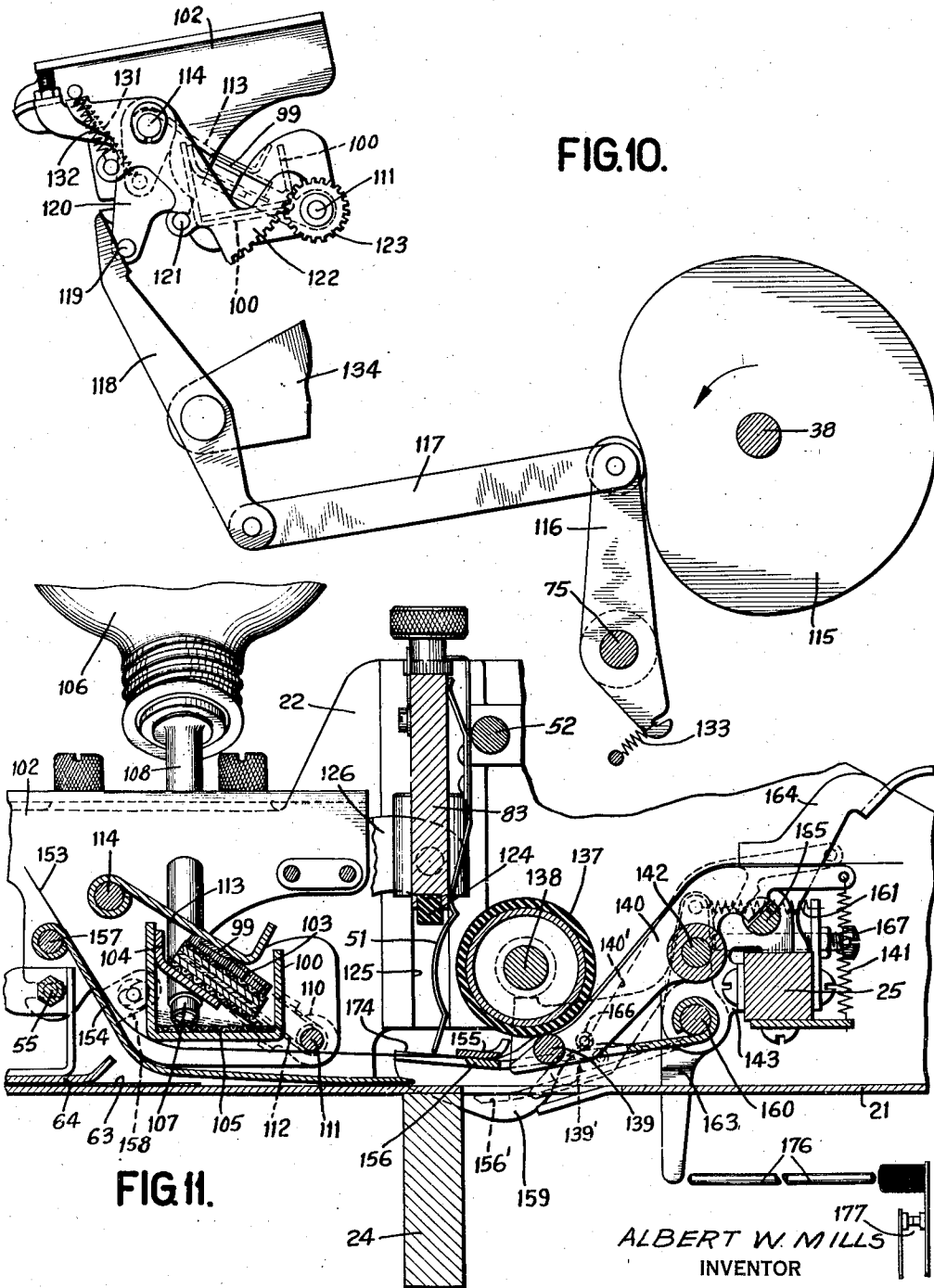


FIG. 10.

FIG. 11.

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UNITED STATES PATENT OFFICE

2,189,043

PRINTING TRANSFERRING MACHINE

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Application November 5, 1938, Serial No. 239,011

16 Claims. (Cl. 101—134.5)

This invention relates to a transfer machine, and particularly relates to a machine for posting ledger sheets by the process of preparing a negative record on the back of the original record, moistening the front of the original with a suitable solvent and pressing the back of the original against the face of the ledger sheet.

One object of the present invention is to provide a novel machine for selectively transferring line by line printed, typed, or written matter directly from an original record to a record sheet or sheets.

Another object is the provision of novel means for moistening the area of the original to be transferred.

Still another object is the provision of novel means of bringing the moistening medium, the original record and the sheet on which the transfer is to be made together but which maintains these elements separated until pressure is applied to effect the transfer.

A further object of the invention is to provide novel means for maintaining the moistening medium moistened with suitable solvent to the degree necessary to obtain a clean and clear copy.

Another object is the provision of novel means to align an original record with a copy sheet.

Another object is the provision of novel means to vary the line spacing of the copy sheet.

Further objects of the instant invention reside in any novel features of construction or operation or novel combination of parts present in the embodiment of the invention described and shown in the accompanying drawings whether within or without the scope of the appended claims and irrespective of other specific statements as to the scope of the invention contained herein, in the drawings:

Fig. 1 is a top plan view of the machine.

Fig. 2 is a sectional view taken on line 2—2, Fig. 1, looking in the direction of the arrows.

Fig. 3 is a sectional view taken on line 3—3, Fig. 2, looking in the direction of the arrows.

Fig. 4 is a detail view of the clutch and clutch release mechanism.

Fig. 5 is a perspective view showing the pressure bar, ribbon operating mechanism and the ledger indexing guide.

Fig. 6 is an enlarged detail sectional view illustrating the pressure bar, paper shields ribbon carrier, solvent reservoir, etc.

Fig. 7 is a detail view showing the operating mechanism for the ledger carriage and the original feed.

Fig. 8 is a detail view showing the mechanism for operating the ledger clamps.

Fig. 9 is a detail sectional view of the ledger carriage.

Fig. 10 is a detail view of the mechanism for operating the cover of the solvent reservoir and the moistening ribbon.

Fig. 11 is a detail view of the part of the mechanism shown in Figure 6.

Fig. 12 is a detail view of one of the ribbon control arms and its latch arm in normal position.

Fig. 13 shows the parts illustrated in Figure 12 in normal position.

Fig. 14 illustrates the method of aligning the original sheet with the ledger sheet.

The original paper from which the copy is to be taken is printed in a conventional manner on a tabulator, typewriter or other suitable medium and is backed with suitable carbon paper while being printed. The original may take the form of single sheets, fanfold or continuous roll.

The transfer is accomplished by interposing a ribbon or similar medium moistened with solvent above the area to be transferred and then applying pressure on the ribbon to bring the ribbon, the original and the ledger sheet or receiving paper together. The solvent dissolves a portion of the carbon from the original and deposits it on the ledger sheet.

The machine includes a table or plate 21 (Fig. 1) supported between side frames 22 and 23. Upon this table is placed the ledger sheet to receive the impression. The frames 22 and 23 are rigidly joined by a lower pressure bar 24 (Fig. 2), bars 25 and 26 and a motor support plate 27.

A motor 28 (Fig. 3) provided to drive the several mechanisms of the machine, is mounted on the plate 27. The motor, through a pulley and belt connection 29 and a gear box 30 supported on the plate 27 operates a short shaft 31 supported in brackets 32 and 33 secured to the plate 27. A clutch disc 34 (see also Fig. 4) fast on the shaft 31 is provided with notches 35 about its periphery with which notches a clutch pawl 36 pivotally carried by a clutch arm 37 fast on a cam shaft 38 cooperates. The cam shaft 38 is supported in a bracket 39 secured to the plate 27 and in the frame 23, the shafts 31 and 38 being in axial alignment.

The arm 37 (Fig. 4) and shaft 38 are normally held against rotation by an arm 40 fast on a short shaft 41 pivotally supported by the brackets 33 and 39 (see Fig. 3). The arm 40 has a shoulder 42 which normally lies in the path of the arm 37 and of a tail of the pawl 36 thus holding the

pawl 36 out of engagement with the disc 34. A stud 43 on an arm 44 fast on the shaft 41 projects through a slot 45 in a link 46 thus supporting the right-hand end of said link 46. The other end of the link is connected to an arm 47 fast on a shaft 48 journaled in the frames 22 and 23. Also fast on the shaft 48 are two release bars 49 one being located near each end of the shaft and being arranged to lie conveniently one on each side of the table 21 (see Fig. 1).

In order to initiate an operation of the machine the operator depresses either of the bars 49 which movement rocks the shaft 48 and arm 47 counterclockwise thrusting the link 46 toward the right. At this movement a lever 50 pivotally carried at the right-hand end of the link 46 and having a notch engaging the stud 43, rocks the arm 44, shaft 41 and arm 40 therewith, removing the shoulder 42 from engagement with the arm 37 and the tail of the pawl 36. The pawl, thus freed, is engaged with one of the notches 35 by a spring 56. The arm 37 and the shaft 38 make one complete counterclockwise rotation.

A cam 57, the outline of which is indicated in Fig. 4 by dot and dash lines for the sake of clearness, fast on the shaft 38 adjacent the lever 50 has a single notch in its periphery cooperating with a stud 58 on the lever 50. As soon as the shaft 38 starts to rotate the cam 57 rocks the lever 50 clockwise freeing the arms 44 and 40 to a spring 59 which immediately restores these arms to their normal positions. Near the end of the rotation the shoulder 42 rocks the pawl 36 out of engagement with the disc 34 and stops the arm 37 and shaft 38. A spring pressed retaining pawl 60 prevents retrograde movement or rebound of the arm 37.

If the operator has released the bar 49 before the end of the rotation of shaft 38 the parts assume their normal positions when the notch in cam 57 comes opposite the stud 58. However, if the bar 49 is held depressed holding the link 46 in its moved position, that is, toward the right, then when the cam 57 releases the lever 50 the end of said lever will rest on top of the stud 43 and it will be necessary for the operator to release the bar 49, permitting a spring 61 (Fig. 4), having one end attached to an arm 62 fast on the shaft 48, to restore the link toward the left before another operation may be initiated.

Ledger carriage

The ledger sheet, indicated at 63 (Figs. 1, 5, and 6) onto which the transfer is to be made is placed on the table 21 with the first line in the case of a new sheet or the next blank line on which a copy is to be made beneath a transparent line finder 64 adjustably mounted on a bar 55 supported in a manner to be described later. This finder has parallel lines scribed thereon to assist the operator in the proper positioning of the ledger sheet. The sheet is located on the table 21 with its left edge beneath spring pressed ledger clamps 65 (Figs. 1, 2, 3, and 8), there being four clamps 65 mounted on the ledger carriage.

The ledger carriage includes a bar 66 (Figs. 1, 2, 3, 7, and 8) secured to a pair of spaced blocks 67 slidably mounted on rods 68 which are supported in brackets 69 secured to and extending inwardly from the left side frame 22. Referring to Fig. 9 it can be seen that the top of the bar 66 is in the same plane as the top

of the table 21. A stop bar 70 is mounted on the bar 66 to locate the edge of the ledger when it is placed in position on the table. The clamps 65 are slidable vertically in the bars 66 and 70 and are normally urged downwardly to grip the paper 63 by springs 71 secured to the under side of the bar 66.

After the ledger sheet is in proper position the operator depresses the release bar 49 whereupon the shaft 38 rotates. Shortly thereafter a cam 72 (Fig. 8) permits a spring 73 to rock clockwise an arm 74 mounted on a shaft 75 supported in the bracket 39 (Fig. 3) and the side frame 23. An arm 76 fast to a shaft 77 (Figs. 3 and 8) is connected by a link 78 to the arm 74. Also fast on the shaft 77 is a bell crank 79 whose downwardly extending arm is connected by a link 80 to a bell crank 81 pivoted on a stud projecting from a bracket 91 secured to the bar 24. A bar 82 supported on the bell cranks 79 and 81 is normally pressed upwardly against the paper clamps 65 and against the tension of springs 71 by the cam 72.

The clockwise movement of the arm 74 described above is transmitted by the link 78 to rock the arm 76, shaft 77, bell crank 79 and due to the connection 80 the bell crank 81 counterclockwise to lower the bar 82. This permits the springs 71 to draw the clamps 65 down gripping the ledger sheet 63 firmly between said clamps and the carriage bar 66.

Shortly after the ledger sheet is gripped, in the manner just described, mechanism now to be described is operated to shift the carriage a distance sufficient to move the selected line from its position beneath the line finder 64 (Fig. 6) to a position under a pressure bar 83. This mechanism includes a pair of cams 84 (Fig. 7) cooperating with a bell crank 85 pivoted on the shaft 75 and which is connected by a link 86 to an arm 87 fast to a shaft 88 supported between the side frames 22 and 23. Another arm 89 also fast on the shaft 88 pivotally carries at its free end a lever 90 having one arm connected by a link 96 to the rear block 67 of the ledger carriage. A spring 97 presses the other arm of the lever 90 against a stud 98 projecting from the arm 89.

As the shaft 38 rotates, the bell crank 85 is rocked clockwise which movement through the link 86, rocks the arm 87, shaft 88 and arm 89 in the same direction. This movement through the link 96 draws the carriage toward the right (Figs. 2 and 7) and toward the rear of the machine (Figs. 1 and 3) for the purpose set forth above.

In order to align the typed matter on the original sheet with the proper column on the ledger sheet there is provided a plurality of index fingers 51 (Figs. 5, 6, 11, and 14) slidably mounted on a rod 52 supported between the frames 22 and 23. The ledger sheet 63 (Fig. 14) is placed in position on the table 21 and manually shifted to position beneath the pressure bar 83 at which point it is directly under the fingers 51. The fingers are now adjusted along the rod 52 to bring the fingers in line with the limits between which it is desired to have the transfer appear as indicated in Fig. 14. With the fingers 51 in their selected positions the original sheet is inserted and the first line of typed matter is positioned as indicated in Fig. 14 with the top of the typed matter aligned with the bottoms of the fingers 51 and the first and last characters in line with the notches in the left-hand and

right-hand fingers 51 respectively. The arms 164 (Fig. 11) are now operated to bring the rolls 139 into contact with the roll 137 thus holding the original sheet 153 in position.

5 The bar 55 which supports the line finder 64 (Fig. 6) is adjustably supported in slots in the side members or plates 101 and 102 of the moisture reservoir, to permit adjustment of said bar and the line finder 64 toward and away from the index fingers 51. The purpose of this adjustment is to vary the line spacing on the ledger sheet 63. It will be remembered that the ledger sheet receives an invariable movement from line finding position to transfer position. Obviously if 15 the line finder 64 is adjusted closer to the transfer position the spacing of the lines transferred to the ledger sheet will be increased, and if the line finder is adjusted farther from the transfer position the line spaces on the ledger sheet will 20 be decreased.

Moistening device

It was stated above that the medium for applying the solvent to the area to be transferred comprises a ribbon. This ribbon, indicated at 99 in Figs. 5, 6, and 10, normally rests in a solvent reservoir comprising a channel member 100 integral with side members 101 and 102 which rest on and are removably secured to projections extending inwardly from the side frames 22 and 23. The ribbon 99 normally rests on a pad 103 resting on an angular plate 104. On the bottom of the channel 100 is a length of wick 105 the purpose of which is to maintain the fluid level of the solvent just high enough so that the lower corner of the pad 103 is immersed therein. The solvent is supplied by an inverted container 106 provided with a spout 107 which is inserted into a receiver tube 108 so that the end of the spout 107 rests on the wick 105. When the machine is in operation it rests with the table 21 at approximately the angle indicated in Fig. 2 in which position the level of the solvent is substantially as indicated by the dotted line 109 (Fig. 6). The purpose of the pad 105 on the bottom of the reservoir upon which the end of the tube 107 rests is to control the level of the solvent in the reservoir. If the end of the tube 107 rested on the bottom of the channel member 100 the level of the solvent would fall until the aperture of 107 was uncovered. Then a sudden rush of liquid would raise the level too high. By use of the pad 105 the liquid is absorbed from the supply 106 as it is used maintaining the level constant.

The pad 103 (Fig. 6) comprises a length of 55 wick next to the angular plate 104. On top of the wick is a plurality of thicknesses of blotting paper and finally on the blotting paper is a length of fabric having a vertical pile or nap. It has been found that this arrangement of materials provides the correct degree of moisture for the ribbon 99 and that the nap obviates the tendency of the ribbon to stick to the pad as is the case when a comparatively smooth fabric is used. The purpose of the piled fabric 103 is to control 65 the amount of solvent reaching the ribbon. Also the pile permits the entire length of ribbon to leave the pad when it is moved to moistening position. If the pad 103 were provided with a flat surface of closely woven or fabricated material the center portion of the ribbon would have a tendency to adhere when the ribbon is moved and the snap of this portion of the ribbon would throw small drops of solvent onto the sheet 153 causing the carbon to run and resulting in a 75 smudged copy.

The ribbon 99 is carried, tightly stretched, between arms 110 (Fig. 5) fast on a shaft 111 pivotally supported in the end plates 101 and 102. Springs 112, one on each arm 110 support and tension the ribbon between said arms. The ribbon, as previously stated, normally occupies a position in contact with the pad 103 it being pressed thereagainst by the weight of a cover 113 fast on a shaft 114 journaled in the plates 101 and 102. At the proper time the cover 113 is raised and the ribbon 99 is swung to the position in which it is indicated by dotted lines 99' (Fig. 6). The mechanism for raising the cover 113 and operating the ribbon arms 110 will now be described.

Referring to Fig. 10, a cam 115 on the shaft 38 rocks an arm 116 on the shaft 75 counterclockwise against the tension of a spring 133 and by a connection 117 rocks a lever 118 clockwise. The lever 118 is pivoted on a stud projecting from a bracket 134 secured to the bar 24 and has its upper end formed to cooperate with a stud 119 carried on the free end of an arm 120 fast on the cover shaft 114. The clockwise movement of the lever 118 rocks the arm 120 and the shaft 114 counterclockwise against the tension of a spring 131 to raise the cover 113 from the position shown in Fig. 10 to the position shown in full lines in Fig. 6.

When the cover 113 is partly open the lever 118, continuing its clockwise travel, strikes a stud 121 on a gear sector 122 free on the shaft 114 rocking said sector counterclockwise against the tension of a spring 132. The sector 122 meshes with a gear 123 fast on the shaft 111, the gear 123 and shaft 111 being thus rotated clockwise to swing the ribbon arms 110 to the position indicated by dotted lines at 110' (Fig. 6) in which position the ribbon 99 occupies a position 99' in the downward path of a platen 124 mounted in the channeled lower edge of the pressure bar 83, just before said bar starts its downward movement.

Pressure bar

The pressure bar 83 is slidable vertically in grooves 125 in the side frames 22 and 23 and is operated by a pair of links 126 (Fig. 2) one being pivotally connected to the bar 83 near each end. The links 126 are connected at their lower ends to arms 127 fast on a shaft 128, one of said arms being disposed near each end of said shaft. The right-hand arm 127 (Fig. 3) is connected by a link 129 (see also Fig. 2) to one arm of a bell crank 130 pivoted on the shaft 75. A pair of cams 136 on the shaft 38 cooperates with anti-friction rollers on the bell crank 130 to rock it first clockwise and then counterclockwise to normal. The clockwise movement of the follower through the link 129, arms 127 and links 126 lowers the pressure bar 83 to cause the transfer and the counterclockwise movement of said bell crank 130 through the same linkage raises the pressure bar to normal position.

Paper feed—original

Referring to Figs. 1, 6, and 7, a feed roll 137 is secured on a shaft 138 journaled in the frames 22 and 23. A plurality of pressure rolls 139 each carried between a pair of arms 140 are pressed against the roll 137 by springs 141 (Fig. 11). The arms 140 are pivotally mounted on a shaft 142 supported in brackets 143 secured to the cross bar 25.

Secured to one end of the shaft 138 is a ratchet 75

wheel 144 (Fig. 7) with which cooperates a spring pressed feed pawl 145 carried on an arm 146 free on the shaft 138. A link 147 connects the arm 146 to an arm 148 pivotally supported on the frame 22. An anti-friction roller 149 normally rests on the flattened end of an arm 150 secured to the shaft 88.

It will be remembered that the shaft 88 rocks first clockwise and then back to normal position under the influence of the cams 84, the arm 150 making a similar excursion (Fig. 7). When the arm 150 rocks clockwise from beneath the roller 149 a spring 151 draws the arm 148 and link 147 downwardly rocking the arm 146 clockwise to retract the pawl 145. After a transfer has been made the cams 84 cause the arm 150 to rock counterclockwise to normal position at which movement an inclined or cam surface 150a of the arm 150 moves the link 147 upwardly rocking the arm 146 counterclockwise to feed the original copy one line space. A spring pressed retainer 152 (Fig. 7) serves to hold the roll 137 and the original copy in alignment.

The original from which a transfer is to be made, indicated at 153 (Figs. 6 and 11), is inserted over a shield 154 passing beneath the reservoir 100, between a bar 155 and a plate 156, between the feed roll 137 and the rolls 139 and over the arms 140. The shield 154 is mounted on a rod 157 extending between the plates 101 and 102 and is further supported by brackets 158 (only one being shown) secured to said plates. The bar 155 is carried between two arms 159 (see also Fig. 1) pivoted on a shaft 160 supported in the brackets 143. A spring 161 holds the arms 159 and the bar 155 in the position in which they appear in full lines in Fig. 11. The plate 156 is secured to the shaft 160 and is normally held in the position in which it is shown in full lines in Fig. 11 by springs 162 (Fig. 1) attached to levers 163 which are also secured on the shaft 160.

In order to insert an original copy sheet a pair of arms 164 (Fig. 11) is rocked counterclockwise. These arms are secured one on each end of a shaft 165 journaled in the brackets 143 and which shaft is provided with notches into which fit the arms 140. Upon counterclockwise movement of the arms 164 and shaft 165 the flattened portions of the shaft bearing against the arms 140 rock these arms also counterclockwise to separate the rollers 139 from the feed roll 137. During this movement studs 166, one on each of the arms 140, contact the plate 156 and carry the latter therewith, the parts being shown in their moved positions at 139', 140' and 156' in Fig. 11. This provides a free passage for the original sheet 153 between the bar 155 and plate 156, and between the feed roll 137 and the pressure rolls 139.

When the arms 164 are restored clockwise to their normal position the springs 141 press the original between the rolls 139 and the feed roll 137. The clockwise movement of the bar 155 is limited by the arms 159 striking collars on the shaft 138. Adjustable stop screws 167 are provided to limit the clockwise movement of the lever 163, shaft 160 and plate 156 so that as the parts appear in their normal position in Fig. 11 there is a slight clearance between the bar 155 and plate 156 to permit free movement of the original 153 when line spaced as above described.

It is important that the ribbon 99, the original copy 153 and the ledger sheet 63 do not come into physical contact until the instant pressure is applied by the pressure bar 83. The reason for this

is that it is desired to produce a clean copy without smudges or smears which would occur if the sheet 153 touched sheet 63 during movement of either, or if the moistened ribbon 99 touched the original sheet 153 before pressure is applied the solvent would cause the carbon deposit on the back of the original to run so that upon application of pressure a smudged copy would result.

In order to avoid this and produce a clean copy these elements are brought into close proximity but not into actual contact just before pressure is applied and are quickly separated thereafter.

To accomplish this the mechanism described above and illustrated in Fig. 10 does not move the ribbon 99 all the way to transfer position but moves the arms 110 which carry the ribbon to approximately the position indicated by dotted lines at 110' in Fig. 6, in which position the arms 110 lie in the paths of arms 168 (Figs. 5 and 6) pivotally mounted on the pressure bar 83. Also mounted on the pressure bar 83 are latch pawls 169 and stretched between arms 168 and pawls 169 are springs 170. Ears 171 on the pawls 169 extend beneath the plates 101 and 102 holding the pawls 169 disengaged from their associated arms 168 when the bar 83 is in its uppermost position.

As the pressure bar 83 commences its downward movement the ears 171 move away from the plates 101 and 102 permitting springs 170 to rock arms 168 until projections 172 thereon come into contact with ears 173 on the arms 168. During the continued downward movement of the bar 83 the arms 168 come into contact with the ribbon arms 110, and, since the springs 170 (Figs. 12 and 15) are of greater strength than the spring 132 (Fig. 10) the ribbon arms 110 are rocked further clockwise to the position shown in full lines in Fig. 6.

Referring to Fig. 11, the arms 159 which carry the guide bar 155 are provided with bent portions or ears 174 which extend into the path of travel of the ribbon arms 110. Projections 175 on the ribbon arms 110 come into contact with these ears carrying the arms 159, the bar 155 and consequently the original sheet 153 downwardly from the position shown in Fig. 11 to that illustrated in full lines in Fig. 6. Just before pressure is applied by the platen 124, said platen, the ribbon 99, original 153 and the ledger sheet 63 occupy the positions in which they are shown in Fig. 6, where it can be seen that, while these members are close together, they are slightly separated. The pressure on the arms 159 also presses the bar 155 downwardly against the plate 156 to grip the original sheet 153 thus preventing displacement of this sheet.

The movement of the pressure bar 83 is continuous downward to apply pressure and then upwardly to its normal position. As the bar continues downwardly from the position shown in Fig. 6, the arms 159 and ribbon arms 110 being stopped by the plate 21, the arms 168 (Fig. 12) rock to the position shown in Fig. 13, the projections 172 moving under the ears 173. The purpose of thus latching the arms 168 in their moved position is to prevent the springs 170 from holding the ribbon arms 110 and the arms 159 down until the arms 168 strike studs 178, in other words, to permit a quick separation of the ribbon 99, original 153 and ledger sheet 63 upon commencement of the upward movement of the bar 83. This quick separation is necessary to prevent smudging and running of the carbon.

As the bar 83 nears the end of its upward stroke the ears 171 of the pawls 169 strike the under sides

of the plates 101 and 102 unlatching the arms 100 which assume their normal positions in readiness for another operation.

As soon as the pressure is released the mechanism illustrated in Fig. 7 moves the ledger carriage to its original position and the cam 72 (Fig. 8) raises the bar 82 to release the grippers 65. The operator may now adjust the ledger sheet 63 to the next line or insert another sheet to the next unused line.

After the pressure bar 83 is restored the cam 115 (Fig. 10) permits the arm 118 to rock counterclockwise under the influence of the spring 133, whereupon the spring 132 rocks the sector 122 clockwise rotating the gear 123 and shaft 111 counterclockwise to restore the ribbon 99 to its position on the pad 103 in the solvent reservoir 100. The arm 118 also permits the spring 131 (Fig. 10) to rock the arm 120 and shaft 114 clockwise to close the cover 113.

Also near the end of the operation, the paper feed mechanism (Fig. 7) operates to feed the original sheet 153 one line space.

Referring to Fig. 11, the lever 163 extends downwardly below the plate or table 21 where it cooperates with a rod 176 suitably mounted to slide horizontally in the machine. The lever 163, as set forth above, is rocked counterclockwise upon operation of the arms 164 to release the rollers 139 for the purpose of removing the old sheet 153 and inserting a new one. This movement of lever 163 thrusts the rod 176 toward the right opening a pair of contacts 177 which are wired in series with the motor 28. This opens the circuit to the motor to prevent operating the machine while inserting a new sheet.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification, it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only as indicated by the scope of the following claims.

What is claimed is:

1. In a machine of the class described, the combination of an original sheet to be transferred, a table to support a copy sheet, a line selecting device for selecting a line on the copy sheet to receive the transfer, means to move the copy sheet from line selecting position to position to receive the transfer, a moistening ribbon, means to move the ribbon to transfer position, and a pressure bar to press the ribbon, the original sheet and the copy sheet together to effect a transfer.

2. In a machine of the class described, the combination of an original sheet to be transferred, a table to support a copy sheet to receive the transfer, means to hold the original sheet in raised position, a moistening ribbon normally out of transfer position, means to partly move the ribbon to transfer position, a pressure bar, means to operate the pressure bar to effect a transfer, and means on the pressure bar to complete the movement of the ribbon to transfer position and to lower the original sheet to transfer position.

3. In a machine of the class described, the combination of an original sheet to be transferred, a table to support a copy sheet to receive the transfer, a moistening ribbon, means to move the copy sheet, the original sheet and the ribbon to transfer position, a pressure bar to apply pressure to said sheets and said ribbon to effect a transfer,

and means to separate the ribbon, the original sheet and the copy sheet as soon as pressure is released.

4. In a machine of the class described, the combination of an original sheet to be transferred, a table to support a copy sheet to receive the transfer, a moistening ribbon normally out of transfer position, a pressure bar, means to move the ribbon part way to transfer position, and means on the pressure bar to complete the movement of the ribbon.

5. In a machine of the class described, the combination of an original sheet to be transferred, a table to support a copy sheet to receive the transfer, a moistening ribbon, a moistening pad, a cover to normally press the ribbon against the pad, means to move the cover out of contact with the ribbon, means to move the ribbon a part of the way to transfer position, a pressure bar, and means on the pressure bar to complete the movement of the ribbon.

6. In a machine of the class described, the combination of an original sheet to be transferred, a table to support a copy sheet to receive the transfer, a moistening ribbon, a pressure bar to effect a transfer, means to move the ribbon part way to transfer position, means on the pressure bar to complete the movement of the ribbon before pressure is applied, and means to latch said means on the pressure bar in ineffective position to permit the ribbon to restore simultaneously with the release of the pressure.

7. In a machine of the class described, the combination of an original sheet from which a transfer is to be made, a moistening ribbon, pressure means to effect a transfer, a moisture reservoir, an absorbent pad in the reservoir said pad being provided with a vertical pile, means to normally press the ribbon against the pile, and means to move the ribbon to position to moisten a portion of the original sheet.

8. In a machine of the class described, the combination of an original sheet from which a transfer is to be made, a ribbon to moisten a portion of said sheet, a moisture reservoir, means to maintain a constant level of liquid in said reservoir, a pad supported above the surface of the liquid and having one edge in contact with said liquid, a piled fabric on said pad, and means to press the ribbon against the piled fabric.

9. In a machine of the class described, the combination of a sheet from which a copy is to be made, a liquid reservoir, a liquid supply, an absorbent pad in the reservoir to control the liquid level, a second absorbent pad, means to transfer moisture from said second pad to moisten an area of the sheet, means on the second pad to control the amount of moisture supplied to the moisture transfer means, and means to press the moisture transfer means against the second mentioned pad.

10. In a machine of the class described, the combination of a sheet from which a copy is to be made, a moistening reservoir, a ribbon to transfer moisture from said reservoir to moisten a portion of the sheet, a liquid supply for the reservoir, an absorbent pad to control the liquid level in the reservoir, a second absorbent pad, and a piled fabric on said second pad to control the amount of liquid supplied to the ribbon.

11. In a machine of the class described, the combination of an original sheet, a table to support a copy sheet, a moistening reservoir, a moistening ribbon normally in the reservoir, means to automatically assemble the ribbon, the original

sheet and the copy sheet, a pressure bar to effect a copy, and means to quickly separate the ribbon, the original sheet and the copy sheet.

12. In a machine of the class described, the combination with an original sheet and a table to support a copy sheet, of a moistening ribbon, means to move the ribbon to copying position, a guide bar and a guide plate for the original sheet, and means to operate the guide bar and guide plate to grip the original sheet and to move said original sheet to copying position.

13. In a machine of the class described, the combination with an original sheet, and a table to support a copy sheet, of a moistening ribbon, support arms for the ribbon, means to operate the arms to move the ribbon to copying position, and means operated by said arms to move the original sheet to copying position.

14. In a machine of the class described, the combination with an original sheet and a table to support a copy sheet, of means to move the copy sheet to copying position, a moistening ribbon, means to move the moistening ribbon to copying position, guide means for the original

sheet, and means to operate the guide means to move the original sheet to copying position.

15. In a machine of the class described, the combination of an original sheet containing material to be copied, a table to support a copy sheet, index fingers wherewith the original sheet may be adjusted in columnar relationship with the copy sheet to select a column to receive the transfer, a line finder for the copy sheet, means to adjust the line finder with respect to the index fingers to vary the line spacing of the copy, and means to automatically move the copy sheet from line finding position to position to receive the copy.

16. In a machine of the class described, the combination of an original sheet, a table to support a copy sheet, adjustable index fingers to selectively indicate the column on the copy sheet to receive the copy, a line finder to selectively indicate the line to receive the copy, means to adjust the line finder with respect to the index fingers to vary the line spacing of the copy, and means to automatically move the copy sheet from line finding position to copy position.

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