FIG. 1.
This invention relates to a transfer machine and more particularly 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.

A particular object of the invention is to provide improved feeding and aligning devices for the record sheets employed in such machine.

A further object is to provide means for effecting automatic and periodic alignment of the original sheet to insure accurate registration of the postings on the ledger sheets.

A further object of the invention is to provide mechanism for controlling the feeding of the original sheet so that multiple posting from a single line may be effected.

A still further object resides in the provision of novel mechanism cooperating with the posting devices for indicating for each line of the original sheet whether or not posting has been effected from the line and how many times such posting has taken place.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of example, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

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

Fig. 2 is a sectional elevation taken on lines 2—2 of Fig. 1.

Fig. 3 is a section taken on lines 3—3 of Fig. 2.

Fig. 4 is an enlarged detail view of the posting mechanism and the sheet feeding devices.

Fig. 5 is a view similar to Fig. 4 with the parts in operated position.

Figs. 6 and 7 are details of the pressure bar equalizing device.

Fig. 8 is a detail view of the clutch and clutch release mechanism.

Fig. 9 is a detail of the operating mechanism for operating the ledger sheet clamps.

Fig. 10 is a detail of the control device for automatically releasing the pressure feed rollers of the original sheet feeding mechanism.

Fig. 11 is a detail of parts of the auxiliary feed and aligning mechanism.

Fig. 12 is a detail of further parts of the feed roller release mechanism.

Fig. 13 is a detail of the operating mechanism for the ledger sheet carriage.

Fig. 14 is a detail of the line space and repeat key mechanism.

Fig. 15 is a detail of the release key locking mechanism.

Fig. 16 is a detail of the ribbon operating mechanism.

Fig. 17 is a detail of the indexing finger operating mechanism.

Figs. 18 and 19 are details of the marking device.

Fig. 20 is a view showing the aligning devices for the ledger sheet.

Fig. 21 is a detail view taken on lines 21—21 of Fig. 20.

Fig. 22 is an enlarged view of parts shown in Fig. 1.

Figs. 23 and 24 are details of a special posting elimination shield.

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 in its general operation is substantially the same as that disclosed in my Patent No. 2,189,043, granted February 6, 1940. The general operation will, therefore, be but briefly described with the improvements of the present invention more particularly explained.

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 bracket 32 and secured to the plate 27. A clutch disk 34 (see also Fig. 8) fast on the shaft 31 is provided with notches 35 about its periphery, with which notch 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 brackets 39 secured to the plate 21, the shafts 31 and 30 being in axial alignment.

The arm 37 (Fig. 8) and shaft 38 are normally held against rotation by an arm 40 fast on a stud 41 supported by the bracket 32 (see Fig. 3). The shoulder 42 which normally lies in the path of the arm 31 and of a tail in the pawl 36, thus holding the pawl 36 out of engagement with the disk 24. A stud 43 on the arm 40 fast on the stud 41 projects through a slot 45 in a link 46 whose right hand end is supported by a spring 46a. The other end of the link is connected to arm 47 fast on a shaft 48 journaled in the frames 22 and 23. Also fast on the shaft 48 is a release bar 49, located near the end of the shaft and being arranged to lie conveniently on one side of the table 21 (see Fig. 1).

In order to initiate an operation of the machine, the operator depresses the bar 49, which movement rocks the shaft 48 and arm 47 counterclockwise thrusting the link 46 toward the right. At this movement, the left edge of notch 45 prevents the stud 43 from rotating the arm thereby, 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 55. The arm 37 and the shaft 38 make one complete counterclockwise rotation.

A cam 51 fast on the shaft 38 adjacent the extension 50 of link 56 has a single notch in its periphery cooperating with a roller 58 on the extension 50. As soon as the shaft 38 starts to rotate, the cam 51 rocks the extension 50 clockwise freeing the arm 40 to be acted upon by a spring 59 which immediately restores the arm to its normal position. Near the end of the rotation of shaft 38, the shoulder 42 reengages and rocks the pawl 36 out of engagement with the disk 24 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 51 comes opposite the roller 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 51 releases the roller 58, the pin 43 will rest on top of the link 46 and it will be necessary for the operator to release the bar 49, permitting a spring 61 (Fig. 6) to work on the spring 62. This action 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.

A cam 52 (Fig. 9) permits a spring 63 to rock and extend the arm 47 fast on a stud 64 and a stud 65. The cam 52 makes one complete counterclockwise rotation. Also fast on the shaft 64 is a release bar 65, located near the end of the shaft and being arranged to lie conveniently on one side of the table 21 (see Fig. 2).

In order to initiate an operation of the machine, the operator depresses the release bar 65, which movement rocks the arm 47 and fast a stud 64 in a stud 65. A stud 66 on the arm 47 projects through a slot 67 in a link 68 whose right hand end is supported by a spring 68a. The other end of the link is connected to a stud 69 supported on a shaft 70 journaled in the frames 22 and 23. Also fast on the shaft 70 is a release bar 71, located near the end of the shaft and being arranged to lie conveniently on one side of the table 21 (see Fig. 3).

In order to initiate an operation of the machine, the operator depresses the bar 71, which movement rocks the arm 47 and fast a stud 64 in a stud 65. A stud 66 on the arm 47 projects through a slot 67 in a link 68 whose right hand end is supported by a spring 68a. The other end of the link is connected to a stud 69 supported on a shaft 70 journaled in the frames 22 and 23. Also fast on the shaft 70 is a release bar 71, located near the end of the shaft and being arranged to lie conveniently on one side of the table 21 (see Fig. 3).

In order to initiate an operation of the machine, the operator depresses the bar 71, which movement rocks the arm 47 and fast a stud 64 in a stud 65. A stud 66 on the arm 47 projects through a slot 67 in a link 68 whose right hand end is supported by a spring 68a. The other end of the link is connected to a stud 69 supported on a shaft 70 journaled in the frames 22 and 23. Also fast on the shaft 70 is a release bar 71, located near the end of the shaft and being arranged to lie conveniently on one side of the table 21 (see Fig. 3).
transfer appear as indicated in Fig. 20. With the fingers 51 in their selected positions, the original sheet is inserted and the first line of typed matter is positioned 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. 4) are now operated to bring the rolls 139 into contact with the roll 137, thus holding the original sheet 153 in position.

The bar 55 which supports the line finder 64 (Fig. 20) is adjustably supported in slots in the side members 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 53. It will be remembered that the ledger sheet receives an invariable movement from line finding position to transfer position. Obviously, if 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 lines on the ledger sheet will be decreased.

Referring to Figs. 4 and 20, the line finder 64 is supported in a frame 228 which is slideable along bar 55 and may be adjusted slightly in the direction of sheet feeding by screws 225 which are collared to straddle the bar. By turning the screws, relative movement is obtained between the frame 228 and bar 55 so that the scribed lines 230 may be accurately adjusted. The frame 228 also has two pointers 231 which are utilized when the ledger sheet does not have a previously printed line of data from which to measure but has ruled lines. Thus when the operator inserts a ledger sheet 53, if there is a previous posting thereon, it is aligned between lines 230, if posting is desired on the next following line. If posting is desired on a some selected line not necessarily the next one, the ledger sheet is positioned so that pointers 231 are on the line above which posting is desired.

Frequently it is desired to post on each of a number of ledger sheets upon a line having the same position from the top edge of the sheet for all of them. In such case, alignment is effected by means of fixedly located stops 232 (Figs. 20 and 21) which are pivoted at 233 on an arm 234. This arm is clamped to the table 21 by thumb screw 235 in the desired position. Insertion of sheet 53 is effected by sliding it forwardly beneath stops 232 and then backing it against the stops which tilt to let the sheet pass. To remove the sheet the upper ends of the stops are depressed by the fingers of the operator to raise the stops out of engagement with the sheet.

**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. 4 and 5 normally rests in a solvent reservoir 100 integrally 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 105 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. 4 in which position the level of the solvent is substantially as indicated by the dotted lines. 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 101 the liquid 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 105 (Fig. 4) comprises a length of wick next to the angular plate 104. On top of the wick is a plurality of thickness 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 plied fabric 103 is to control 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. The snap of this portion of the ribbon would throw small drops of solvent on to the sheet 153 causing the carbon to run and resulting in a smudged copy.

The ribbon 99 is carried tightly stretched between arms 110 fast on a shaft 111 pivotally supported in the end plates 101 and 102. 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 journalled in the plates 101 and 102. At the present time the cover 113 is raised and the ribbon 99 is swung to the position in which it is indicated by dotted lines (Fig. 5). The mechanism for raising the cover 113 and operating the ribbon arms 110 will now be described.

Referring to Fig. 16, 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 secured on a shaft 117 whose one end has an arm 118a fast thereon (Fig. 3). The upper end of arm 118a cooperates 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 to raise the cover 113 from the position shown in Fig. 4 to the position shown in full lines in Fig. 5.

When the cover 113 is partly open, the lever 118a continuing its clockwise travel strikes the stud 121 on a gear 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 114, the gear 133 and shaft 111 being then rotated clockwise to swing the ribbon arms 110 to the position indi-
cated by dotted lines (Fig. 5), in which position the ribbon 99 occupies a position in the downward path of a platen 124 mounted in the channel 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 24 (Figs. 1 and 9) and is operated by a pair of links 128, one being pivotally connected to the bar 83 near each end. The links 128 are connected at their lower ends to arms 121 fast on a shaft 141, one of said arms being suspended near each end of said shaft. An arm 128 (Fig. 2) is connected by a link 129 to one arm of a bell crank 140 pivoted on the shaft 152. A pair of cams 156 on the shaft 30 cooperates with antifriction rollers on the bell crank 140 to rock it first clockwise and then counterclockwise to normal. The clockwise movement of the lower through the link 128, arms 121 and links 128 lowers the pressure bar 83 to cause the transfer and the counter-clockwise movement of said bell crank 140, through the same linkage, raises the pressure bar to normal position.

The shaft 121 at one end carries an arm 230 (Figs. 3 and 17) to which is connected a link 231 extending to a lever 238 which in turn is connected by a link 239 to an arm 240 on shaft 52. As shaft 115 is rocked clockwise to rotate the ribbon 99, a spring 241 will cause counterclockwise rocking of shaft 52 so that the fingers 81 thereon will be rocked out of the path of travel of the ribbon to the position shown in Fig. 5.

**Paper feed—original**

Referring to Figs. 4 and 5, a feed roll 137 is mounted 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. The arms 140 are pivotally mounted on a shaft 142 supported in brackets secured to the cross bar 25.

Secured to one end of the shaft 138 is a ratchet wheel 151 (Fig. 16) with which cooperates a spring pressed feed pawl 146 carried on an arm 146 free on the shaft 138. A link 147 connects the arm 146 to an arm 145 pivotally supported on the frame 22. An antifriction roller 149 normally rests on the flattened end of an arm 150 secured to the shaft 152.

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. 3). When the arm 150 rocks clockwise from beneath the believer the roller 145, 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 feed pawl 152 (Fig. 16) 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. 4 and 5) is inserted over a shield 154 passing beneath the reservoir 160, 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 mount-

ed on a rod 187 extending between the plates 101 and 102. The bar 155 is carried between two arms 159 (see also Fig. 2) pivoted on a shaft 160 supported in the brackets 143, and spring 161 holds the arms 159 and the bar 155 in the position in which they appear in full lines in Fig. 2. 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. 4 by springs 162 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. 4) is rocked counter-clockwise. 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 160 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 in dotted outline in Fig. 4. 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 sheet 153 tightly 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 (Fig. 2). Adjustable stop screws 167 are provided to limit the clockwise movement of the shaft 160 and plate 156 so that, as the parts appear in their normal position in Fig. 4, 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. 16 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 in Fig. 5, in which position the arms 110 lie in the paths of arms 168 (Fig. 7) pivotally mounted on the pressure bar 83. Also mounted on the pressure bar 83 are latch pawls 169 and stretched between arms 110 and 120. The springs 170. Pins 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 (Fig. 8).
As the pressure bar 83 commences its downward movement, the pins 171 move away from the plates 101 and 102. During the continued downward movement of the bar 83, the arms 168 come into contact with the ribbon arms 110 and, since the springs 115 (Figs. 6 and 7) are of greater strength than the springs 122 (Fig. 16), the ribbon arms 110 are rocked further clockwise to the position shown in full lines in Fig. 5.

Referring to Fig. 7, the arms 158 which carry the guide bar 159 are provided with bent portions or ears 174 which extend into the path of travel of the ribbon arms 110. The ribbon arms 110 come into contact with these ears carrying the arms 168, the bar 158 and consequently the original sheet 163 downwardly from the position shown in Fig. 4 to that illustrated in full lines in Fig. 5. Just before pressure is applied by the platen 124, said platen, the ribbon 89, original 158 and the ledger sheet 63 occupy the positions in which they are shown in Fig. 5, where it can be seen that, while these members are close together, they are slightly separated. The pressure on the arms 158 also presses the bar 159 downwardly against the plate 160 to grip the original sheet 163, thus preventing displacement of this sheet.

The movement of the pressure bar 83 is continued downward to apply pressure and then upwardly to its normal position. As the bar continues downwardly from the position shown in Fig. 5, the arms 158 and ribbon arms 110 being stopped by the plate 21 the arms 168 rock to the position shown in Fig. 7, where the arm 168 is latched by arm 169. 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 168 downward. When the arms 168 strike stud 172, in other words, to permit a quick separation of the ribbon 89, original 158 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 168 which assume their normal positions in readiness for another operation.

As soon as the pressure is released, the mechanism illustrated in Fig. 13 moves the ledger carriage to its original position and the cam 12 (Fig. 9) raises the bar 32 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. 16) permits the arm 118 to rock counterclockwise under the influence of the spring 123, whereupon the spring 132 rocks the sector 122 clockwise rotating the gear 123 and shaft 141 counterclockwise to restore the ribbon 99 to its position on the pad 103 in the solvent reservoir 100. The pin 131 causes arm 120 to return to rock shaft 114 clockwise to close the cover 113.

Also near the end of the operation, the paper feed mechanism (Fig. 14) operates to feed the original sheet 163 one line space.

Referring to Fig. 4, the lever 163 extends downwardly below the plate or table 21 where it operates with levers 176 suitably mounted to rock on a suitable rod. The lever 163, as set forth above, is rocked counterclockwise upon operation of the arms 164 to release the rollers 178 for the purpose of removing the old sheet 163 and inserting a new one. This movement of lever 163 rocks the levers 178, opening a portion of contacts 177 which are wired in series with the motor 50. This opens the circuit to the motor to prevent operating the machine while inserting a new sheet.

The foregoing describes the operation of the machine substantially as is shown in the patent referred to. The improvements of the present invention will now be set forth with particular reference to their relationship with the structure of the prior machine.

Original sheet feeding mechanism

It is to be noted that the original sheet 163 requires to be fed with considerable exactitude, so that a line of printed data is presented beneath the pressure bar for each operation of the feeding mechanism. Generally, the operator of the machine observes the movement of the original sheet, and by means of the usual vernier adjusting knob designated at 80 (Fig. 1) effects a slight rotation of the feed roll 137 in either direction with respect to its supporting shaft 138, if there has been any slight creep or slippage of the sheet with respect to the printing position. Where the original sheet employed is of the continuous perforated edge type, the mechanism about to be described will function to automatically and periodically adjust the sheet, so that the operator's attention in this respect is not required.

Referring to Figs. 1, 4, and 22, a pair of plates 181 are fastened one to each of the side frames 22 and 23. These two plates are spaced apart by a tie bar 182 and serve to support a shaft 185. Mounted on the shaft are two pin wheels 184 which are allded along the shaft but through key and slot connection are arranged to rotate therewith. At one extremity of shaft 183 there is secured a gear 185 (Fig. 11) which meshes with a gear 186. The latter is pivoted at 187 on an arm 188 (see Fig. 22) which in turn is pivoted on a stud 189 carried by a side plate 191. The stud 189 is a gear 190 meshing with gear 188 also meshing with a gear 191 which is integral with the feed roll 137. The gears 191 and 185 are of the same diameter so they rotate with a 1:1 ratio. The arm 188 lies in the plane of the hub of gear 185 and the free end of the arm is normally spaced a slight distance away from the hub (Fig. 11) where it is held by the following mechanism.

As seen in Fig. 22, the arm 188 is integral with a shorter arm 192 which lies beneath a pin 193 and in an arm 194, which latter is normally urged clockwise as viewed in Fig. 12 by a spring 195. The pin 193 rides in a cam slot 196 of a member 197 which is secured to the shaft 165, to which the pressure roll release arm 164 is also secured. When the arm 164 is in position to permit the pressure rolls 169 to engage the feed roll 173, pin 193 is in the left hand end of slot 196, so that arm 194 is in its clockwise position as viewed in Fig. 12 and through arm 192 holds the arm 168 in its position of Fig. 11, away from the hub of gear 185. When shaft 165 is rocked clockwise, arm 192 rides outwardly into the concentric portion of cam slot 187, causing pin 193 to rock away from the arm 192 and causing spring 195 to rock arm 188 against the hub of gear 185, carrying gear 186 with it. This slight movement causes gear 185 to advance slightly ahead of the feed roll gear 191.
Referring to Fig. 4, the original sheet is passed beneath the feed roller 137 as usual and then over the pin wheels 184 as shown. To do this arm 188 freely pivoted on shaft 189 is rocked clockwise carrying with it retaining plates 200 (Fig. 1) which are slidably positionable along the shaft 189 and which serve to hold the sheet in position on the pin wheels. With the pressure rolls 139 against the feed roll, the latter will advance the sheet in the usual manner and the pin wheels 184 will rotate therewith, with the pins moving idly in the perforations of the sheet. Oder each revolution of feed roll 137 or specified otherwise, the perforations of the sheet being eleven teeth in the ratchet wheel 144, Fig. 14, the pressure rolls 139 are moved away from the feed roller 137 by partial rotation of shaft 165 which, as has just been pointed out, also effects a slight additional rotation of the pin wheels 184. With the sheet so freed, this slight additional rotation of the pin wheels will cause the pins to engage the leading edges of the perforations and, where there has been any slight slippage within the last eleven operations, the pins will advance the sheet a slight extent. Thereafter, the pressure rollers 139 reengage shaft 189 against they are aligned with the perforated edges and engage the holes. The thumb screws are then turned down to hold the parts in such position. Thereafter, an internally threaded knob 218 mounted on plate 181 for rotation therein but constrained against axial movement may be rotated. This knob is threaded on the extremity of shaft 189 and will thus move the shaft slightly in either direction, to move the pin wheels and the sheet to a position of exact alignment with respect to the ledger upon which posting is to be effected.

Repeat key operation

Referring to Fig. 14, a repeat key 219 is provided which is horizontally slidable on a pin 220 and has a notch 221 which drops over a shoulder 222 when the key is pressed inwardly, to hold the key in such position, a spring 223 serving to hold the key in a slightly rocked position with the right edge of the notch 221 engaging shoulder 222. In such position the inner end 224 of the key will lie in the path of an extension 225 of the arm 144, so that when the key is operated the arm is prevented from rocking effectively. A slight rocking, however, is permitted during which the spring pressed pawl 226 moves to a position above the extension 224, so that on the return movement of arm 146 pawl 226 will engage and disengage the extension 224, causing the key to rock about pin 220 and disengage notch 221 from pin 222. The spring 227 will thereupon return the key to its normal position. This repeat key is pressed before a line is to be posted, so that the master or original sheet is not advanced during the posting operation but remains for second posting. During the second posting, however, feeding will be effected. Should a third posting be required from any line of the master sheet, the key is pressed a second time just prior to making the second posting.

A device shown in Figs. 18 and 19 is provided to indicate on the lines of the original sheet which lines have been posted. This device comprises a capped cylinder 250 from which a tube 251 extends downwardly beside the pressure bar 83. The cylinder contains a marking fluid which passes down through the tube by means of a suitable wick. The cylinder is secured to...
one end of a leaf spring 252 whose other end is fastened to a guide 253 which may be positioned along a slide 254 and secured as by a thumb screw 255. When the pressure bar 253 descends, the lower end of tube 251 will touch the sheet 153 and make a mark thereon, as indicated at 256 (Fig. 20), spring 252 flexing when the tube strikes the paper. As noted in Fig. 20, the mark 256 is made just above the line posted from.

When the repeat key is operated it moves a link 257, connected thereto into a position when a cam portion 258 thereof lies in the path of a lever 259 pivoted to the pressure bar. Thus, when the pressure bar descends for the first of two positions, lever 259 will be rocked by cam 258 and will move slide 264 to the left as viewed in Fig. 18, carrying with it the marking cylinder 250 and tube 251, so that the mark made will be to the left of its normal location. Upon return of the bar 83, spring 260 restores the parts to the position of Fig. 18, so that during the second posting stroke (key 219 having been restored as explained) the mark will be made in its normal position, resulting in two marks appearing side by side as indicated in Fig. 20, to denote that the related line was posted twice.

Referring to Figs. 1 and 6, there are provided two pressure adjusting knobs 261 above the pressure bar 83 which serve to adjust and equalize the pressure applied. These knobs are threaded 30 to shouldered pins 262 whose lower ends are pivoted to the actuating arms 126. Thus the pins 262 make an excursion with arms 126 of invariable extent. By turning the knobs 261, pins 262 and the pressure bar 83 are relatively shifted, springs 263 serving to urge them apart. Thus, when thick ledger sheets are to be used, the bar 83 is moved and when thinner sheets are used, the bar is adjusted downwardly. To indicate the relative adjustment of the parts, pointers 264 are provided, one at each end of bar 83. Each pointer is pivoted at 265 to bar 83 and has a short arm 266 resting on a shoulder of pin 262 against which it is held by a spring 267. A scale 268 indicates the relative displacement of bar 83 and pin 262, and with the scale reading the same for both ends of the bar, the operator knows that the pressure will be uniform along the length of the bar.

To prevent operation of the release bar 49 (Fig. 1) there is provided a lever 210, positioned as shown in Fig. 1, which is pivoted at 271 (Fig. 15) and has a depending slide 272. Arm 272 connects with a slide 273 which normally lies in the path of arm 62 (see Fig. 8) so that operation of bar 49 and lever 62 is prevented. When a ledger sheet is placed in position it rocks lever 270 counterclockwise (Fig. 15) and withdraws slide 273, sets to free lever 27 for operation. A bell crank 274 pivoted at 275 has one arm engaging a pin 276 in arm 272 and the other arm engaging bar 82 so that when bar 82 is moved to down to permit the clamps 65 to grip the ledger sheet, bell crank 274 is rocked and in turn it rocks lever 270 away from the ledger sheet so as to not interfere with its movement into posting position.

Frequently there may be some data on the original sheet 153 which it is not desired to transfer to or post upon the ledger sheet. For this purpose, a resilient shield 280 (Figs. 23 and 24) is provided which may be slipped upon bar 82 as shown and held in position by a spring clip 281. When in position as shown, the shield is interposed between the pressure bar 83 and sheet 153 on one side and the ledger sheet 63 on the other side so that when the bar descends the sheet 153 will not contact sheet 63 at the place where shield 280 is located.

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 having an original sheet to be transferred, a table to support a copy sheet, a pressure bar to press the original sheet and copy sheet together, said bar being repeatedly operable, in combination with feed rollers normally engaging said original sheet to line space the same for each operation of the pressure bar, an aligning device for engaging the original sheet and adjusting the same to bring the lines thereon into a right angle relationship with the direction of feeding, said device being normally ineffective, and means called into action periodically for disengaging the feed rollers from the original sheet and rendering the aligning device effective.

2. In a machine of the class described having a sheet to be advanced past a fixed position line by line and an impression member operable repeatedly, once for each line presented to the fixed position, in combination with a feed roller frictionally engaging said sheet to line space the same for each operation of the impression member, a pin wheel geared to said feed roller and having its pins coating idly in perforations in said sheet, and means controlled by said feed roller for causing the roller to be ineffective to feed the sheet, said pin wheel thereupon engaging the sheet for feeding thereby.

3. In a machine of the class described having a sheet to be advanced past a fixed position line by line and an impression member operable repeatedly, once for each line presented to the fixed position, in combination with a feed roller frictionally engaging said sheet to line space the same for each operation of the impression member, a pin wheel geared to said feed roller and having its pins coating idly in perforations in said sheet, means for causing the pin wheel to oscillate, and means operative after a predetermined number of line space operations for freeing the sheet from feeding engagement with the roller and rendering the pin wheel ineffective whereby the pin wheel will engage the leading edges of the holes in the sheet and move the same.

4. In a machine of the class described having a sheet to be advanced past a fixed position line by line and an impression member operable repeatedly, once for each line presented to the fixed position, in combination with feeding means normally engaging the sheet to line space the same for each operation of the impression member, a second feeding means adjacent to the first feeding means and idly engaging the sheet, driving means therefor, and means automatically effective after a predetermined number of line space operations for rendering the first named feeding means ineffective and concomitantly rendering the second feeding means effective.

5. The invention set forth in claim 4, in which
the second feeding means is effective only during the interval after the predetermined number of line spacing operations and before the next following line space operation.

6. The invention set forth in claim 4 in which manually positionable means is provided and means controlled thereby when in one position, rendering the second feeding means ineffective, when in another position rendering the first feeding means ineffective and when in a third position rendering both feeding means effective.

7. In a machine of the class described having a sheet to be advanced past a fixed position line by line and an impression member operable repeatedly, once for each line presented to the fixed position, in combination with a feed roller, line spacing mechanism therefor, a pressure roller normally pressing the sheet against the feed roller for advance thereby, a manually operable release lever for disengaging the pressure roller from the feed roller and means operable after a predetermined number of line spacing operations for automatically operating said release lever to momentarily release the sheet.

8. In a machine of the class described having a sheet to be advanced past a fixed position line by line and an impression member operable repeatedly, once for each line presented to the fixed position, in combination with a feed roller, line spacing mechanism therefor, a pressure roller normally pressing the sheet against the feed roller for advance thereby, a manually operable release lever for disengaging the pressure roller from the feed roller, a cam connected to the feed roller and means controlled by said cam upon each revolution of the feed roller for causing an operation of said release lever to momentarily release the sheet.

9. The invention set forth in claim 8 in which timing means is provided and coordinated with the line spacing to cause said momentary operation of the release lever to occur during the interval between two successive spacing operations.

10. In a machine of the class described, a pair of pin wheels, a driving shaft therefor, said wheels being slideable on the shaft for alignment with hole columns in a record to be advanced, fingers for sliding the wheels along the shaft, a rod supporting said fingers, means for clamping the fingers to the rod after the wheels are positioned, and means for moving the rod either in the direction of its axis to concurrently slide both wheels along the shaft.

11. In a machine of the class described having a table, a pressure bar, an original transfer sheet, a copy sheet being positionable in superposed relationship between said bar and table for transfer of a line of data from the transfer sheet to the copy sheet, in combination with a supporting bar connected to the table, a shield positionable along said supporting bar and extending between said sheets beneath the pressure bar to prevent transfer of data from a selected part of the transfer sheet.

12. In a machine of the class described, a table, a pressure bar, a transfer sheet positioned between the bar and table, a copy sheet being positionable beneath the transfer sheet to receive copy upon operation of the pressure bar, power means to operate the bar, a key lever operable to render the power means effective, said lever being normally locked against operation and means controlled by a copy sheet when one is placed in copying position for causing unlocking of said key lever whereby said pressure bar is operable only when a copy sheet is in position.

13. In a machine of the class described having a table, a pressure bar, an original transfer sheet, a copy sheet being positionable in superposed relationship between said bar and table for transfer of a line of data from the transfer sheet to the copy sheet, means for operating the pressure bar, line spacing mechanism for advancing the original sheet after each transfer operation, a marking device effective upon each transfer operation to make a mark on the original sheet adjacent to the transferred line in combination with, a repeat key, means controlled thereby for preventing operation of the line spacing mechanism upon the first operation of the bar following actuation of the repeat key, so that a second operation of the bar will repeat the transfer of the same line of data, and further means controlled by said key for causing the marking device to make two spaced marks adjacent to the transferred line of data.

14. 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 positionable stop attached to said table against which stop the edge of the copy sheet is placed, said stop being located with respect to the index fingers to select a predetermined position on the copy sheet, said stop being manually tiltable out of the plane of the copy sheet to enable the sheet to be readily removed by sliding in the direction of the stop after a copy has been effected, and means to automatically move the copy sheet from said stop to position to receive the copy.

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