

June 2, 1959

W. H. UHL ET AL
PRINTING MACHINE

2,888,873

Filed May 10, 1956

18 Sheets-Sheet 1

Fig. 1.

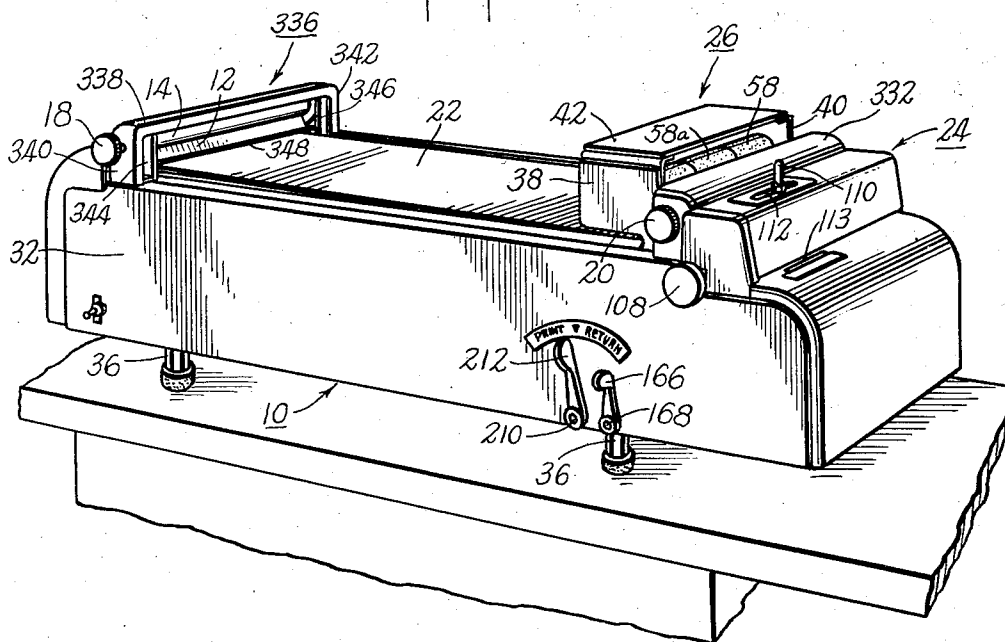
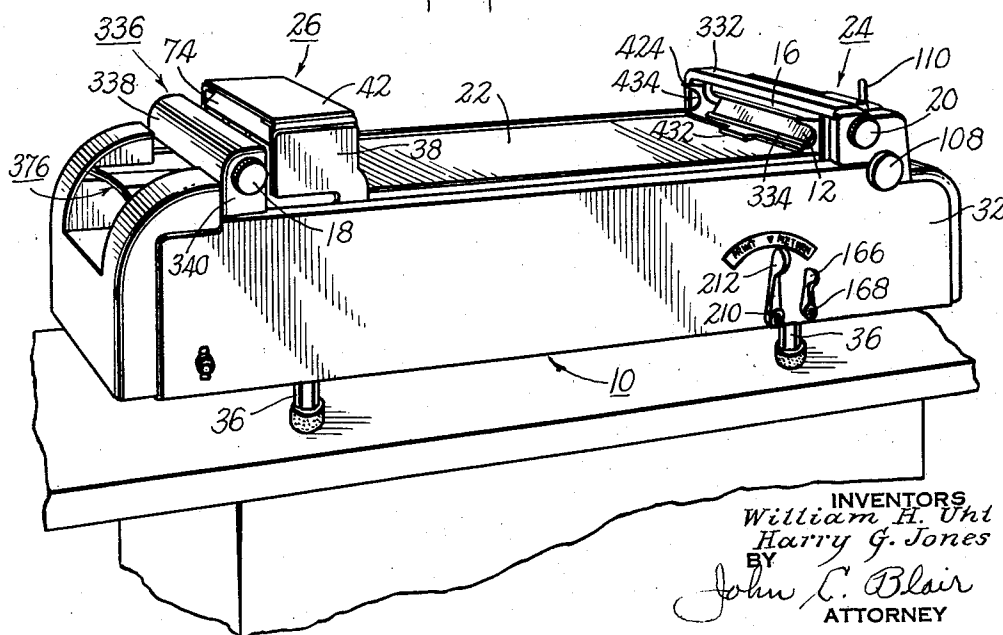


Fig. 2.



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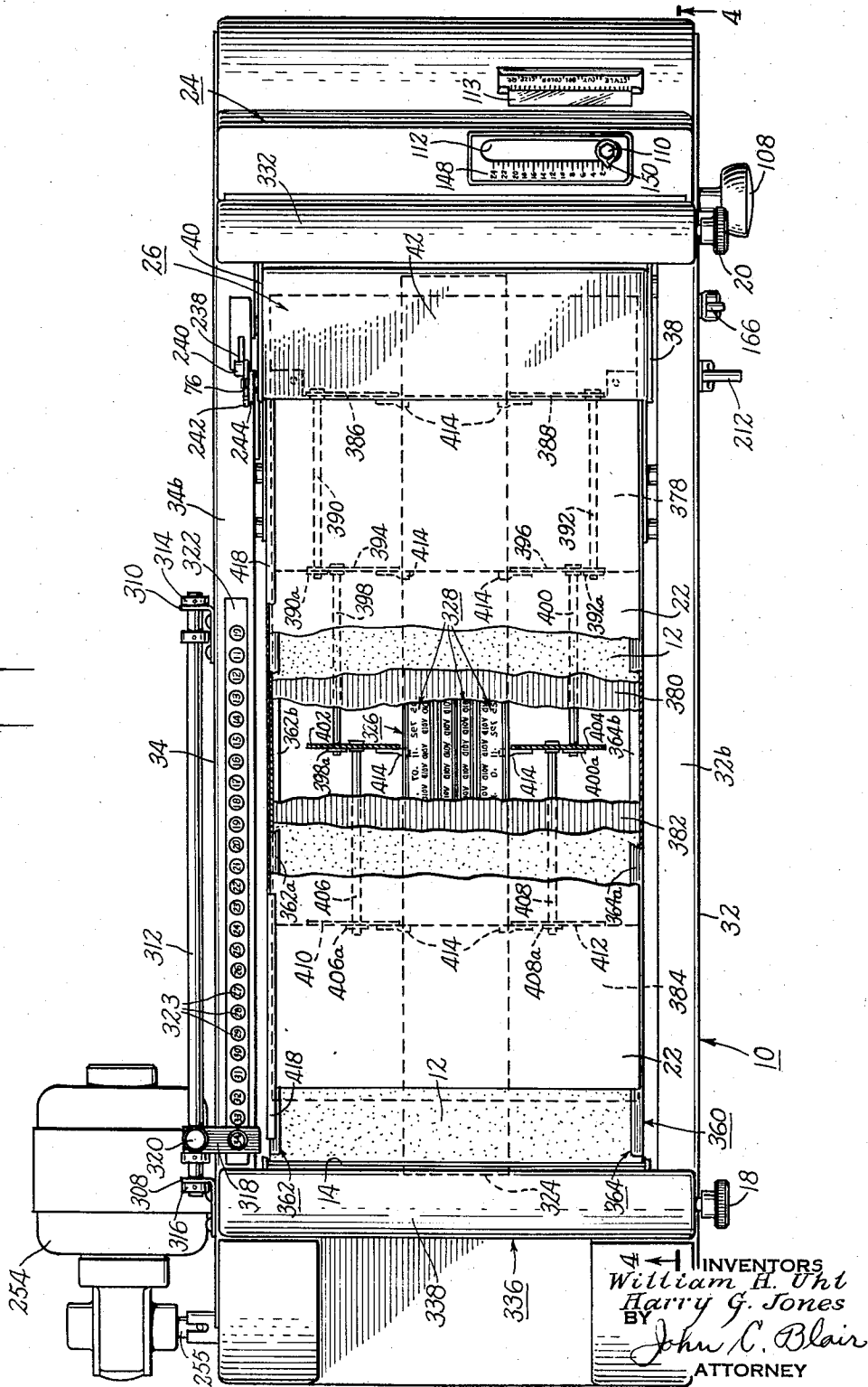
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Fig. 3.



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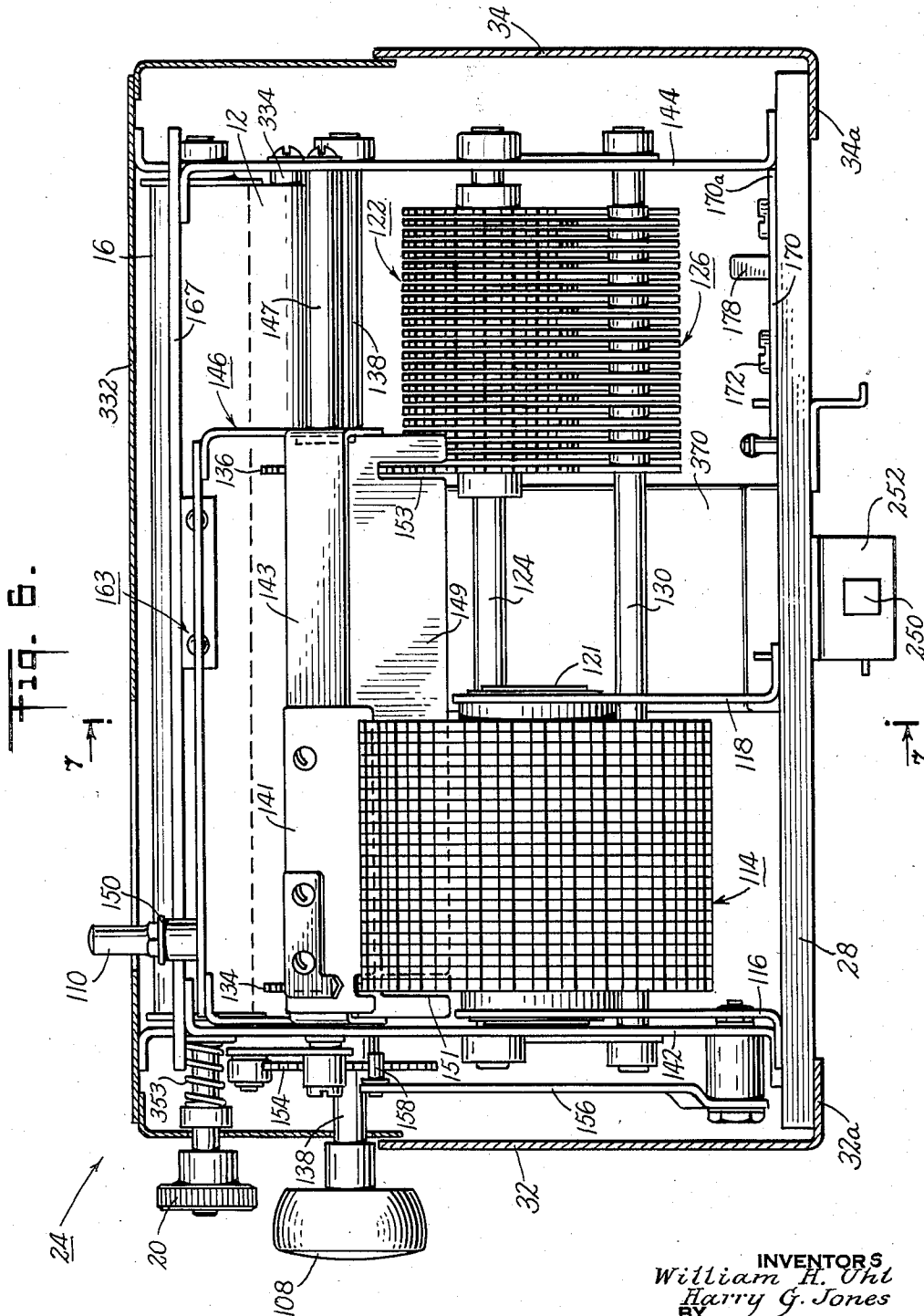
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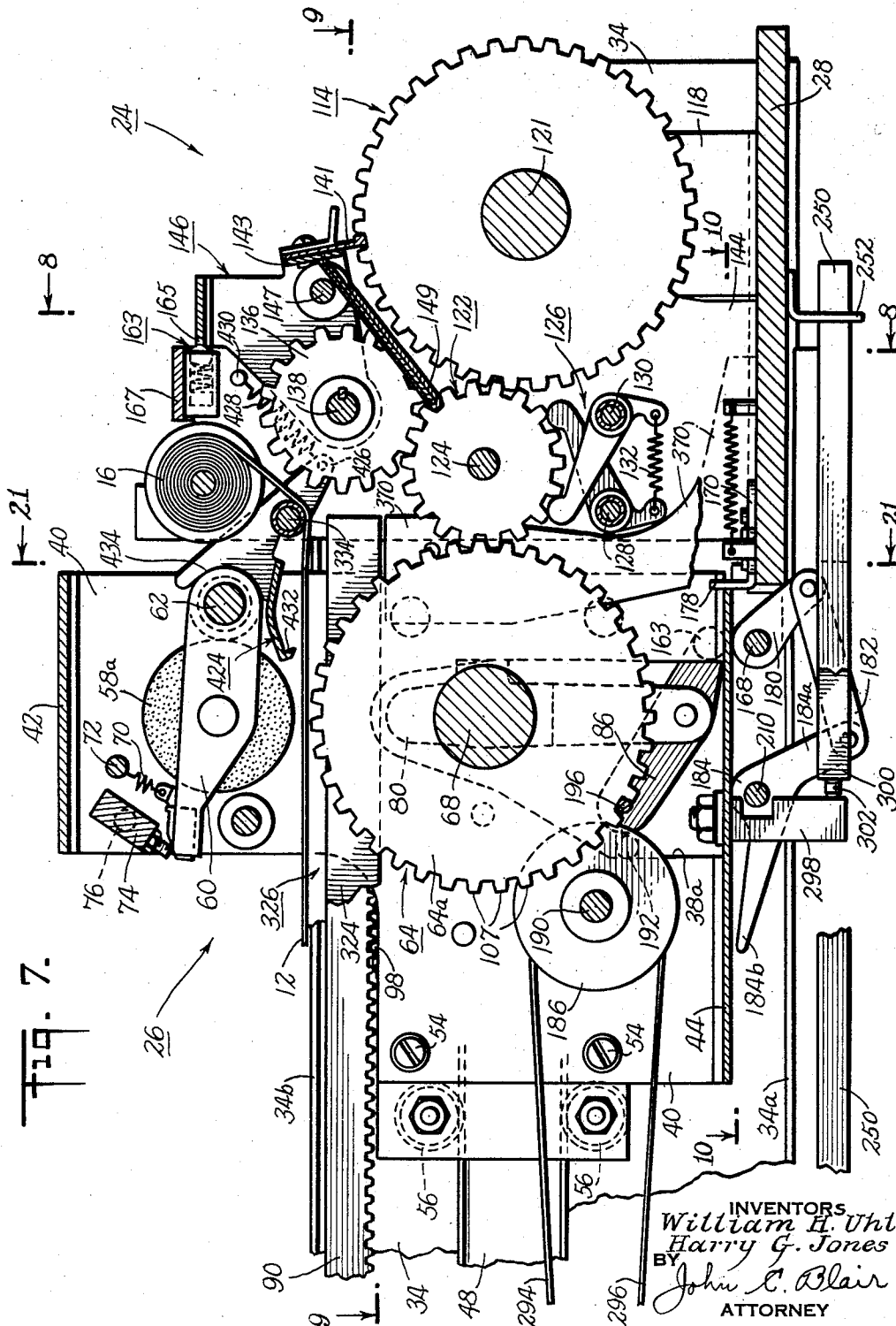
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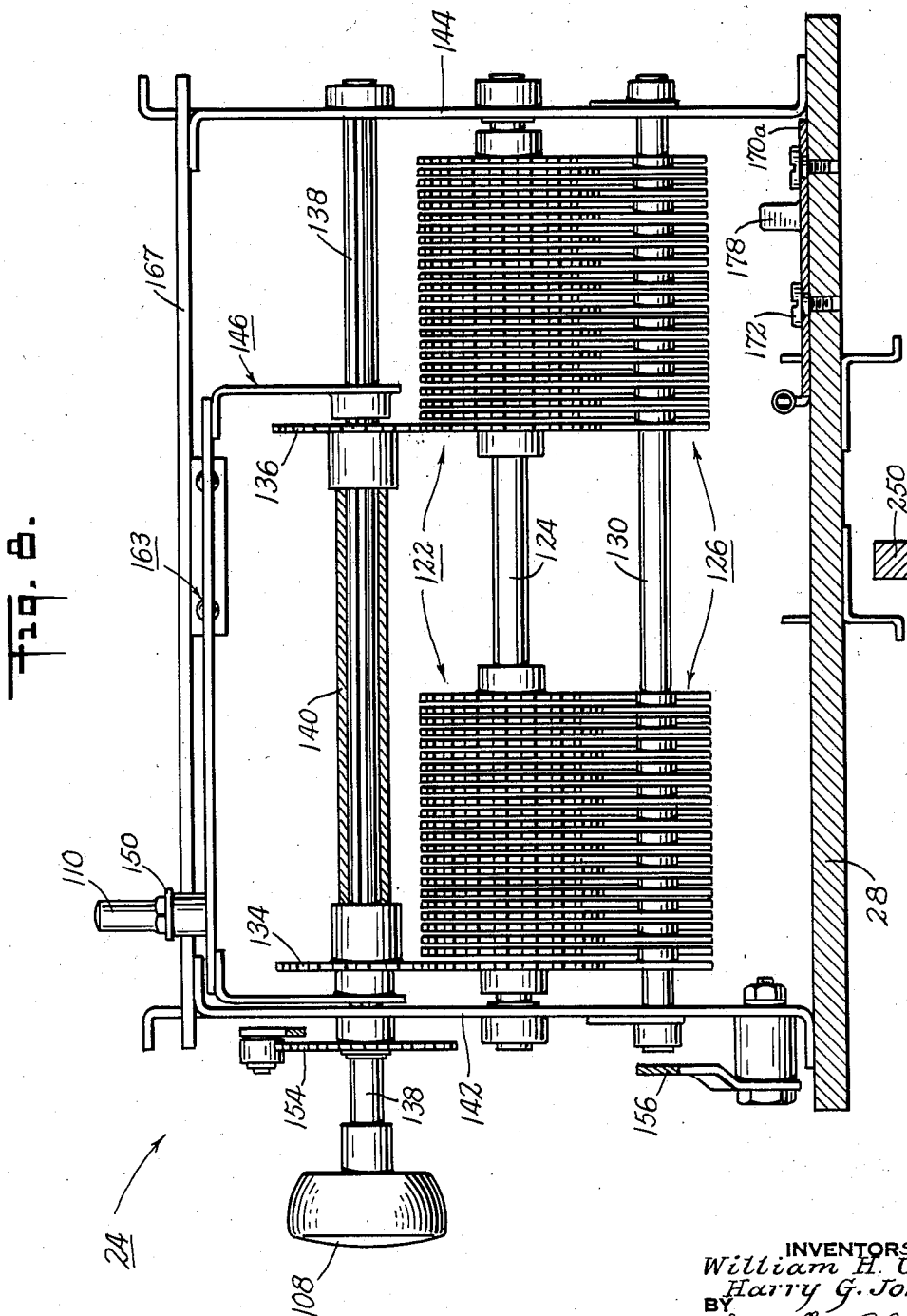
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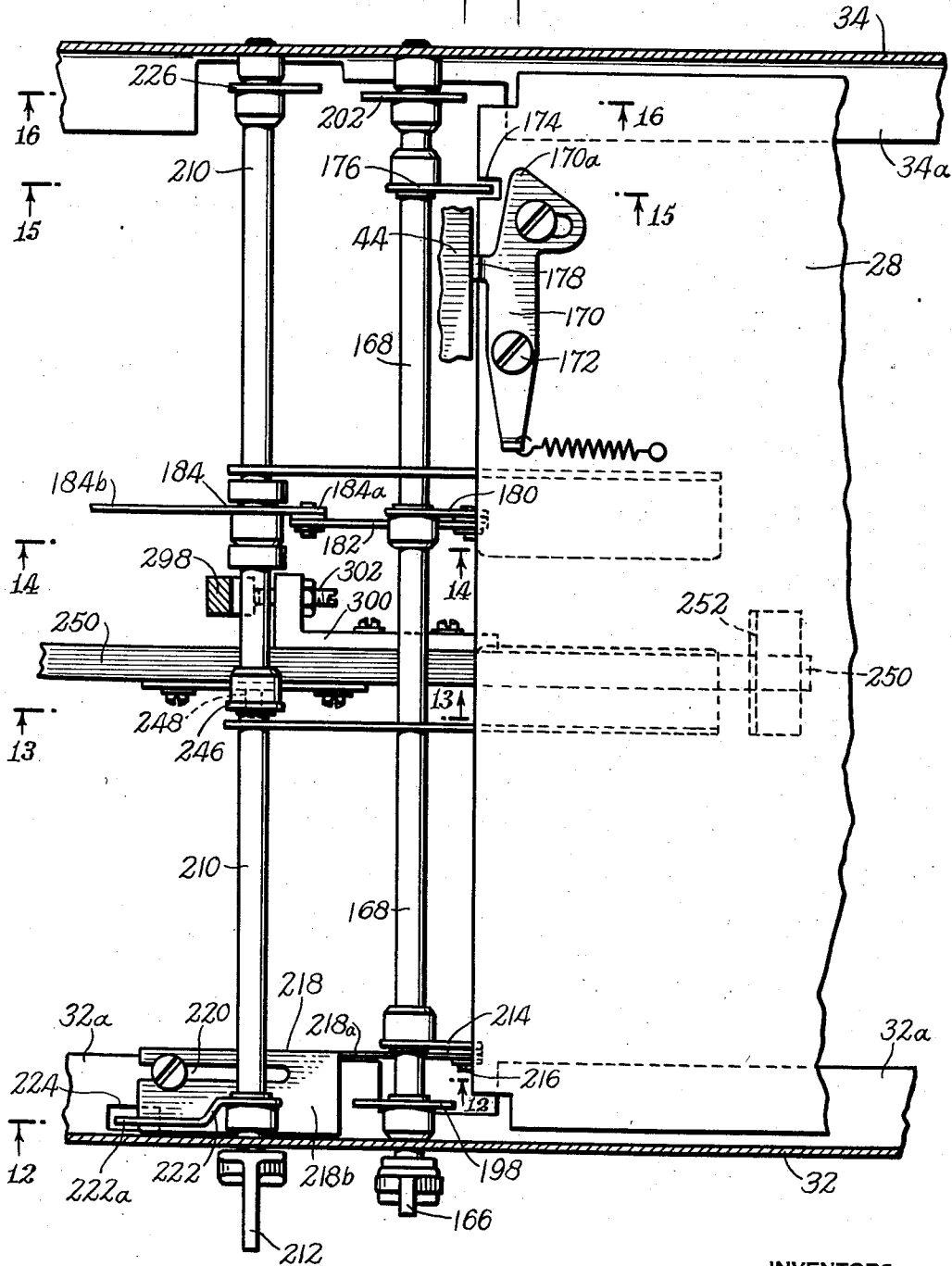
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Fig. 10.



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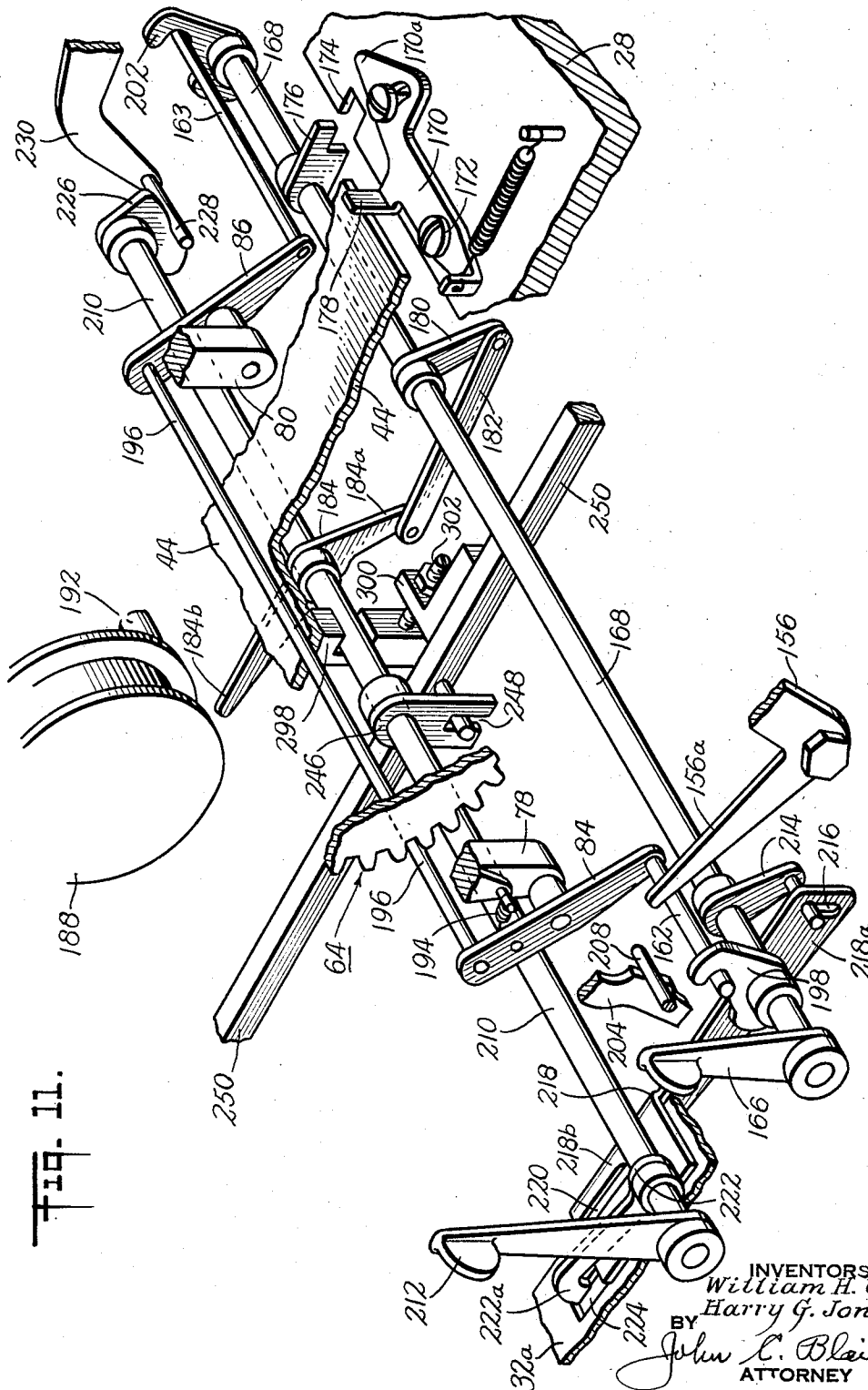


Fig. 11.

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Fig. 12.

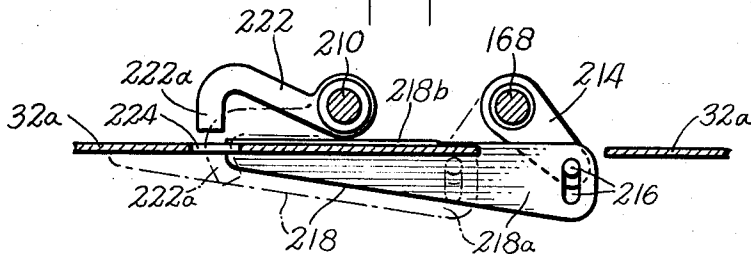


Fig. 13.

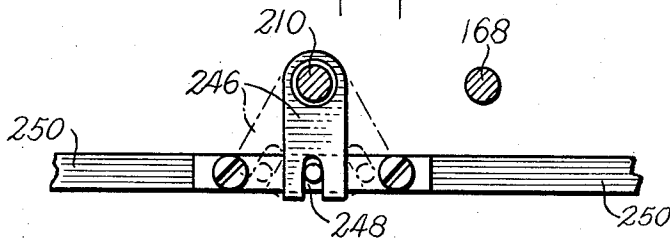
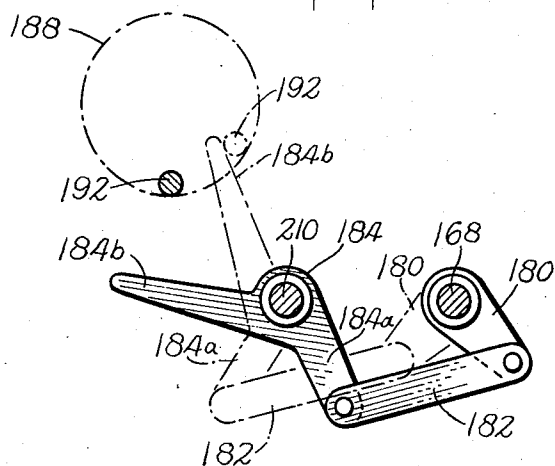


Fig. 14.



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Fig. 15.

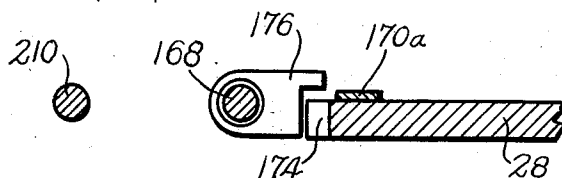
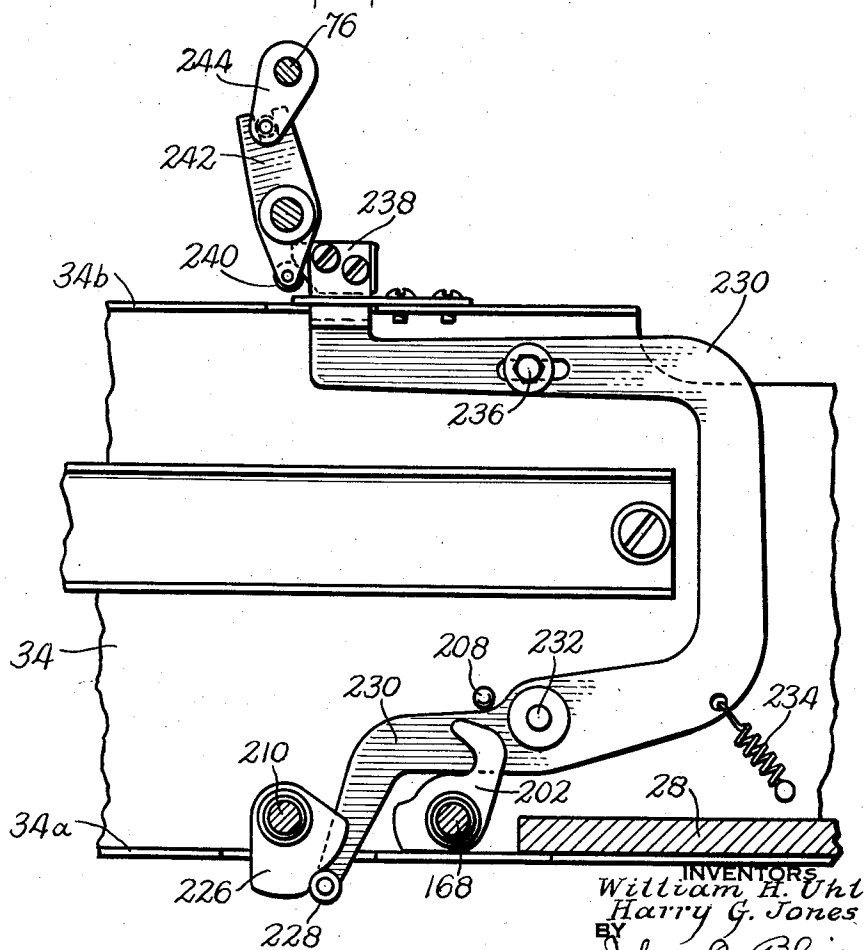


Fig. 16.



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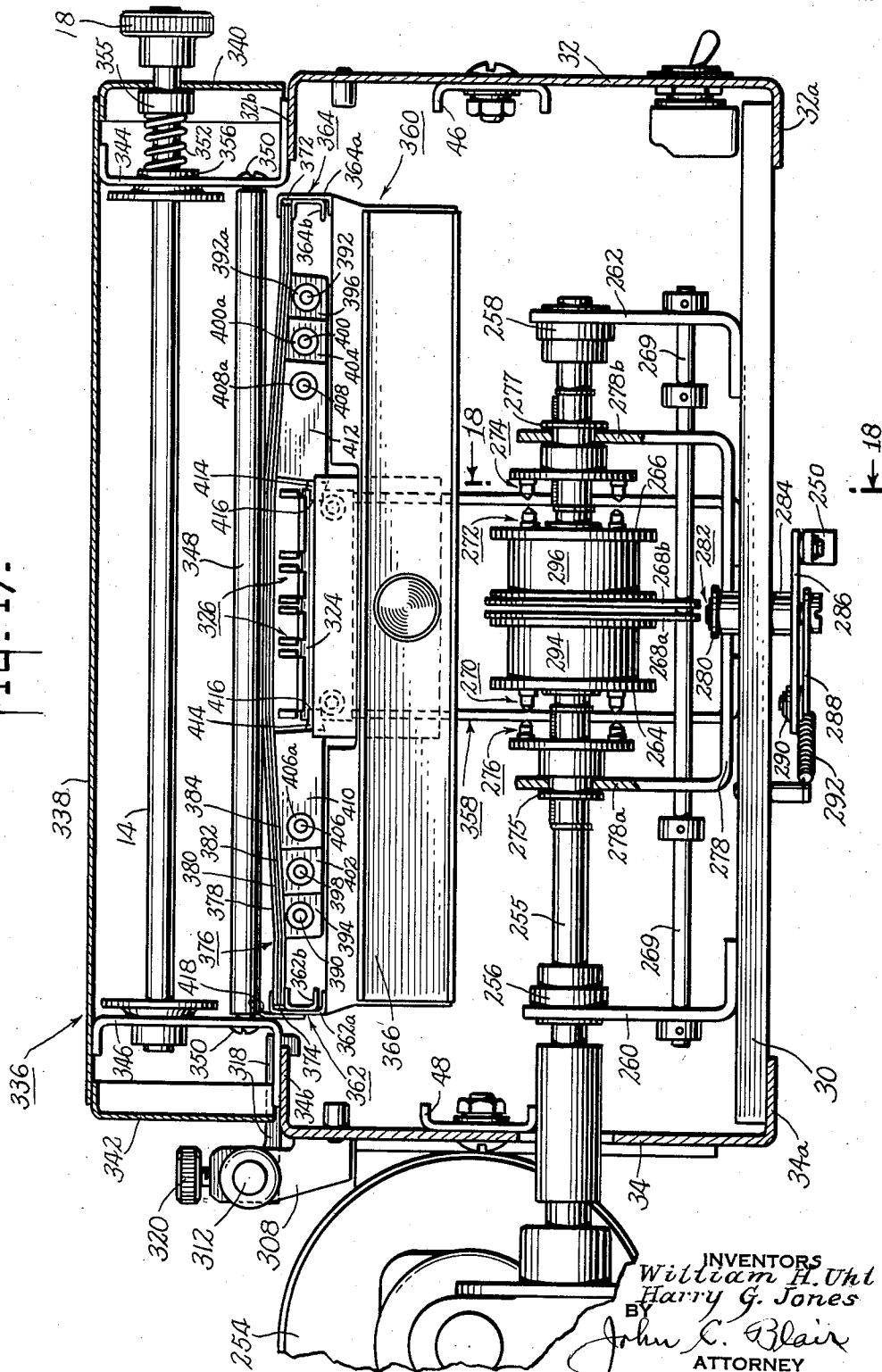
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Fig. 17.



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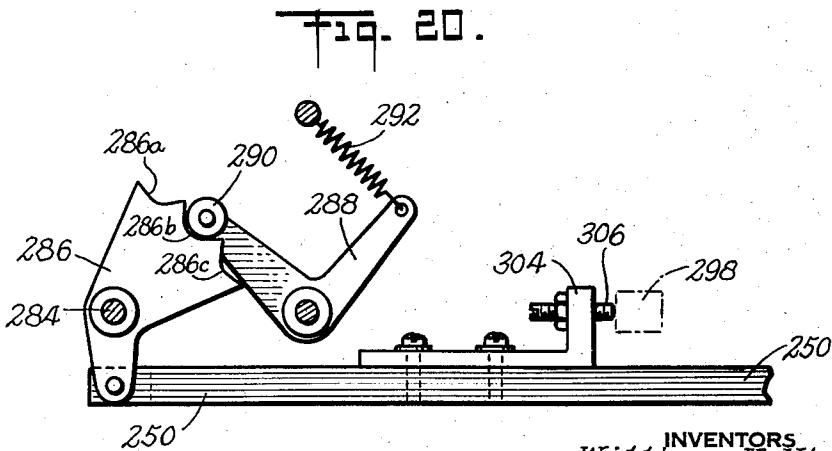
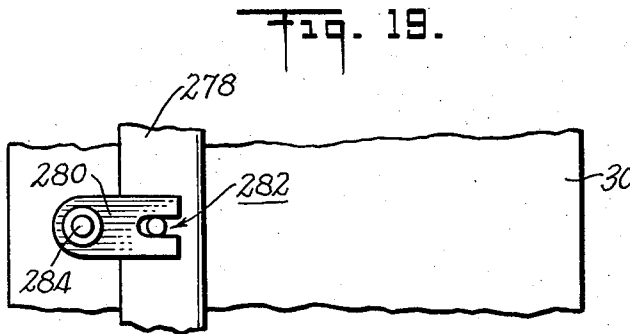
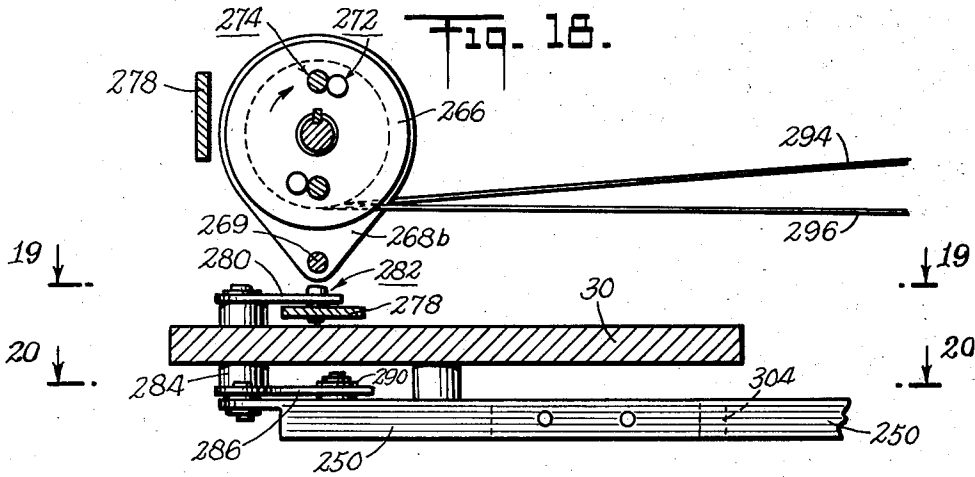
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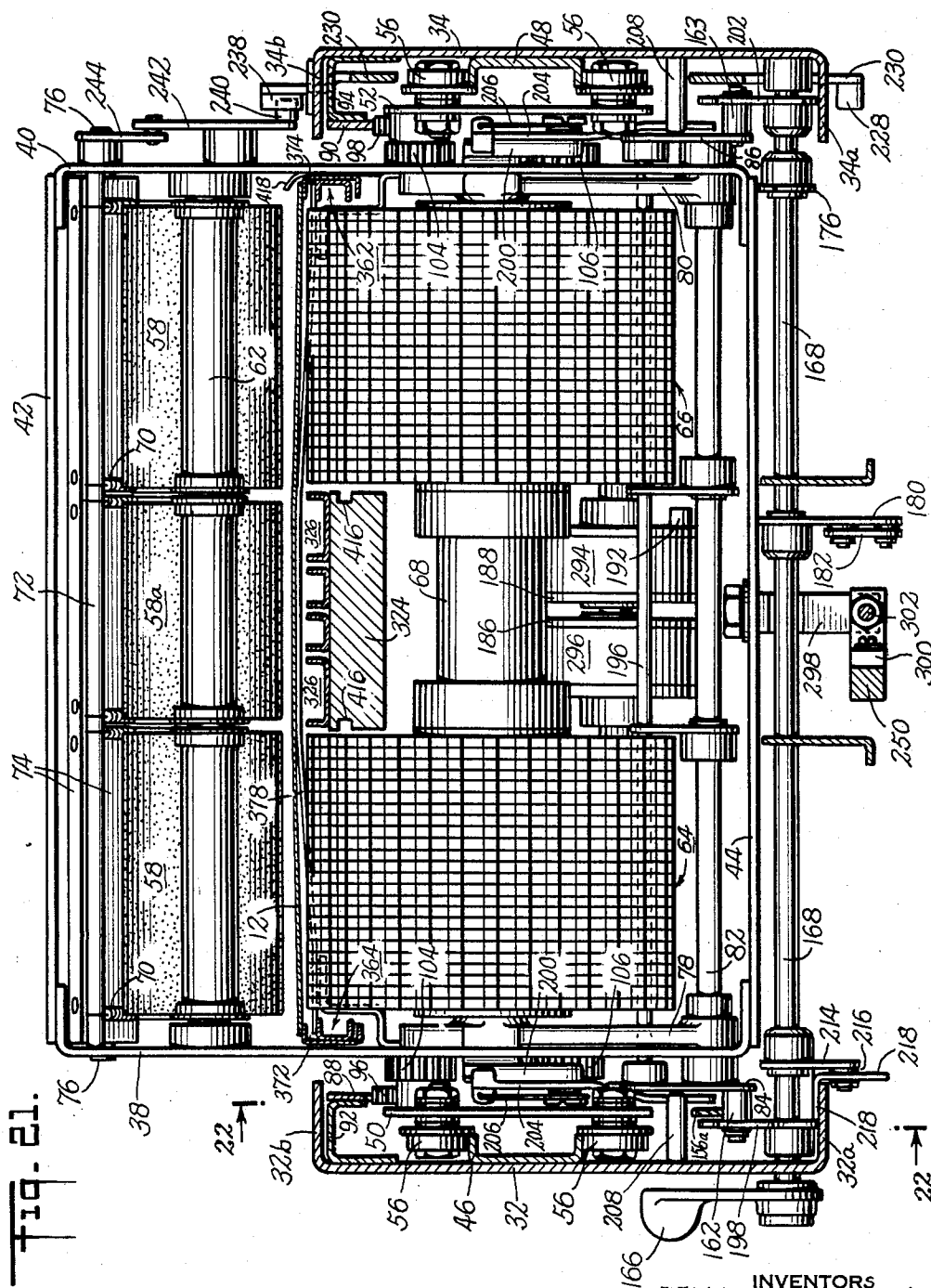


Fig. 21.

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Fig. 22.

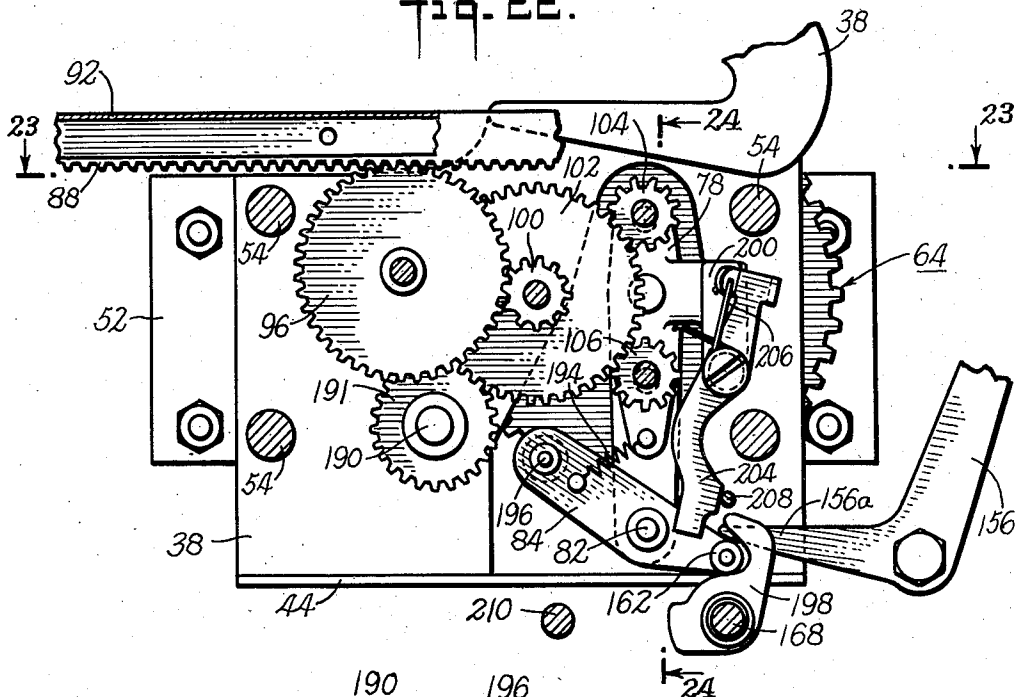


Fig. 23.

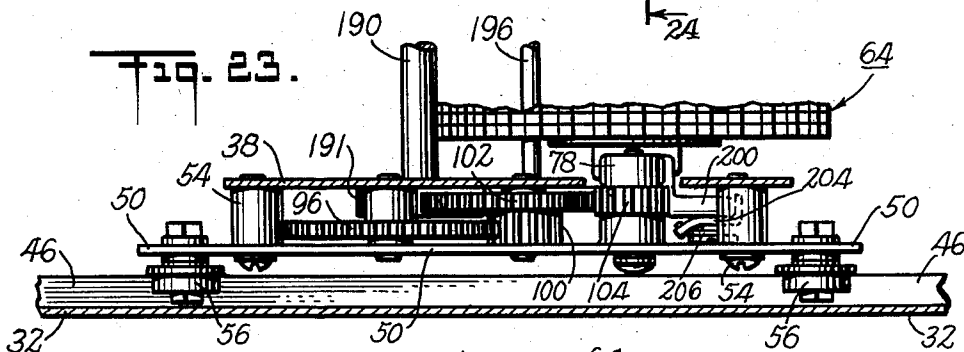
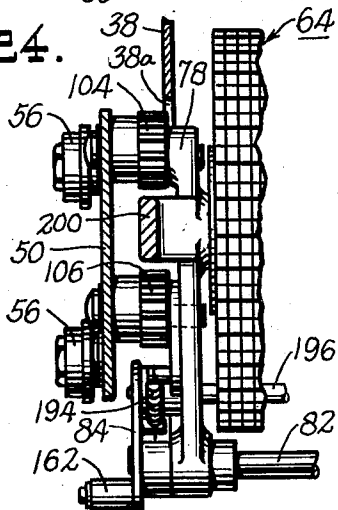


Fig. 24.



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Fig. 25.

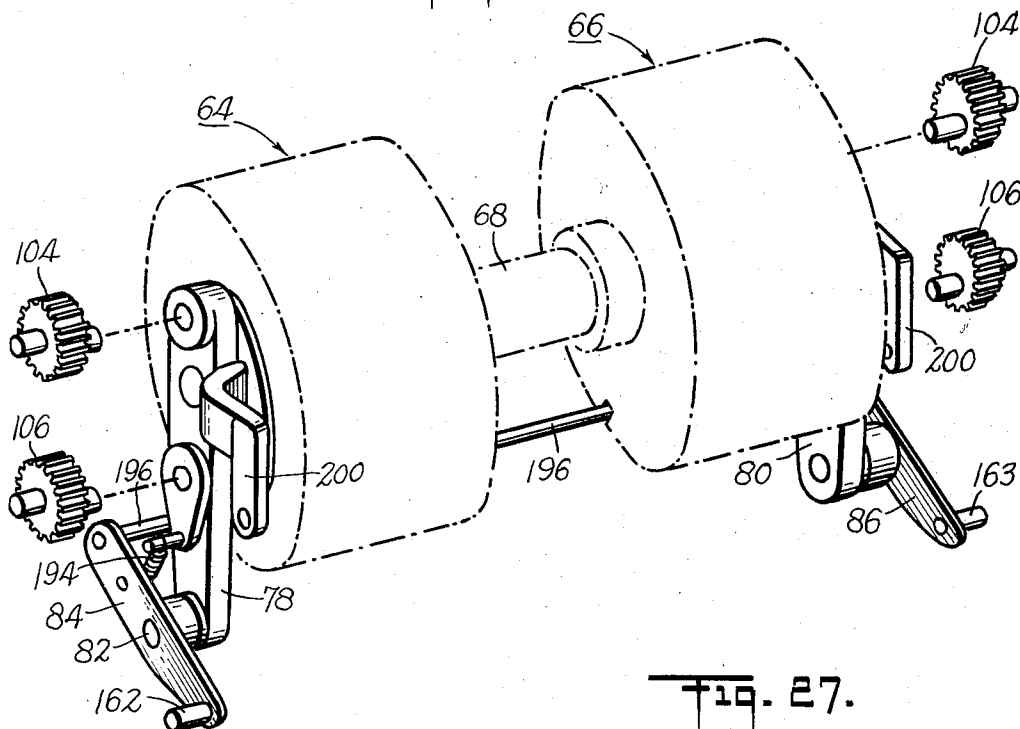


Fig. 26.

SETTING

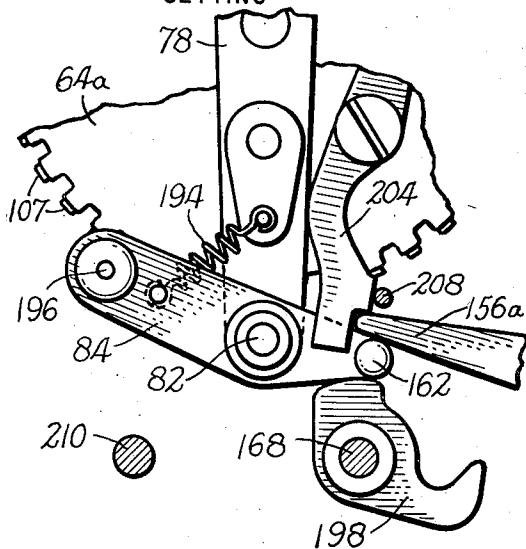
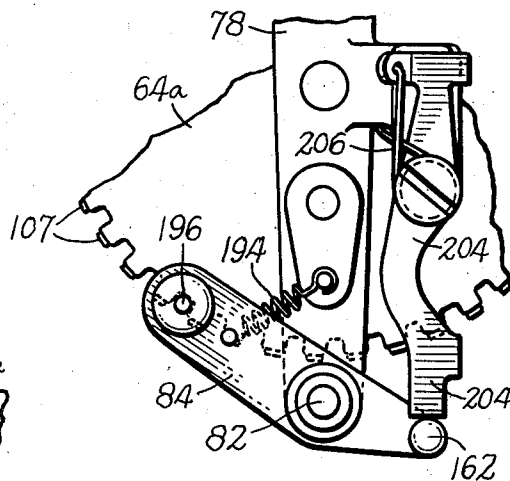


Fig. 27.

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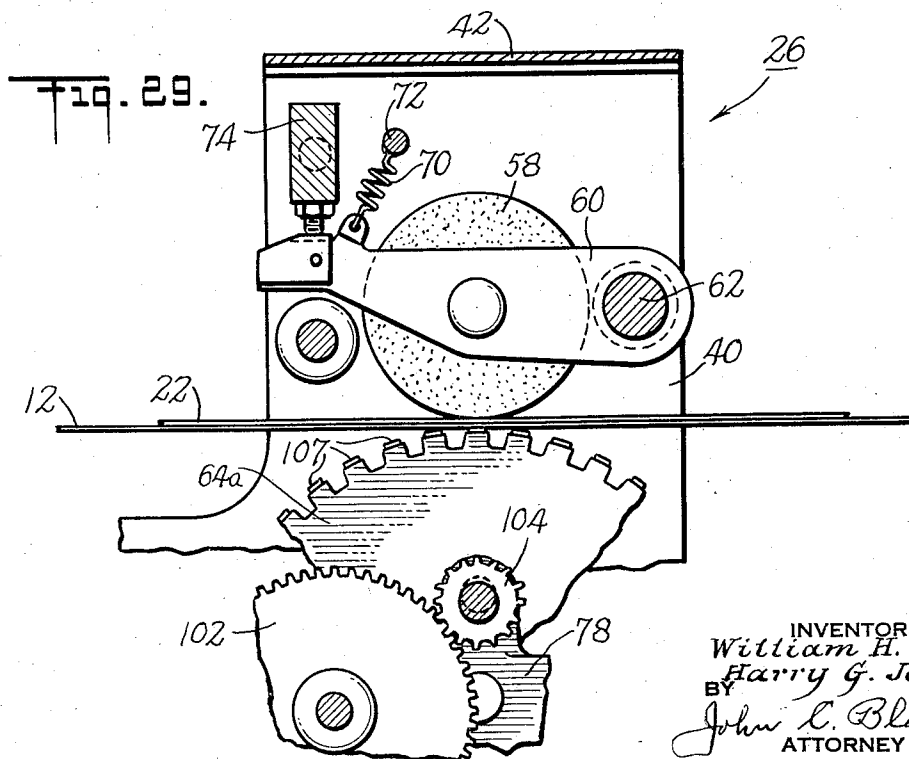
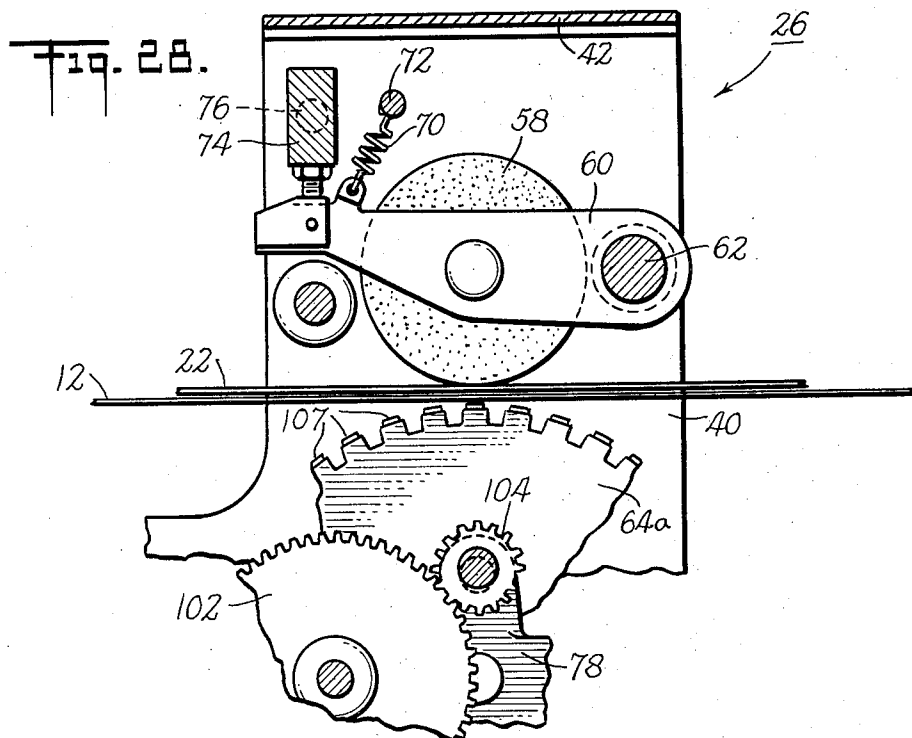
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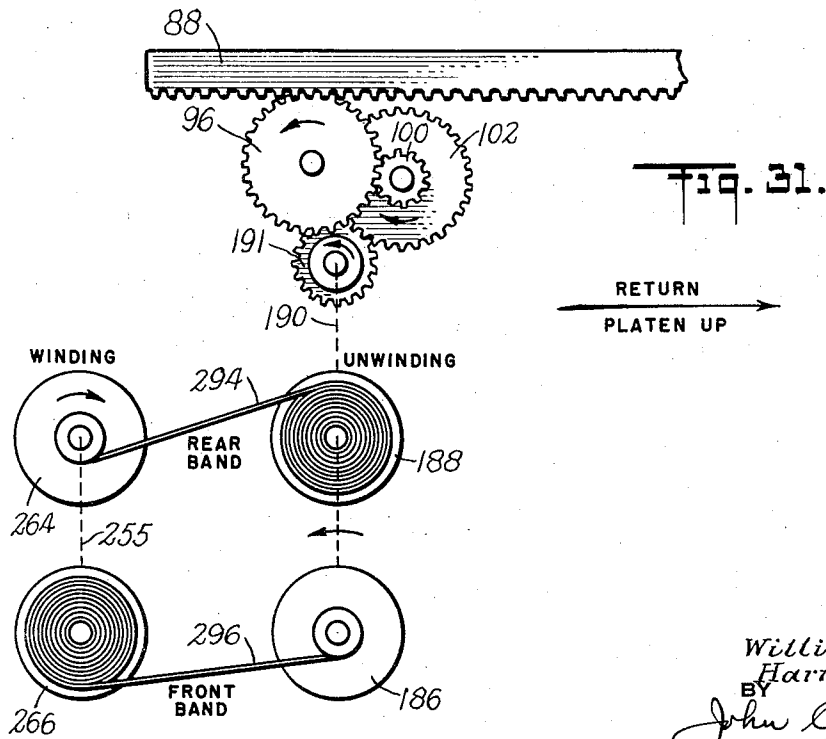
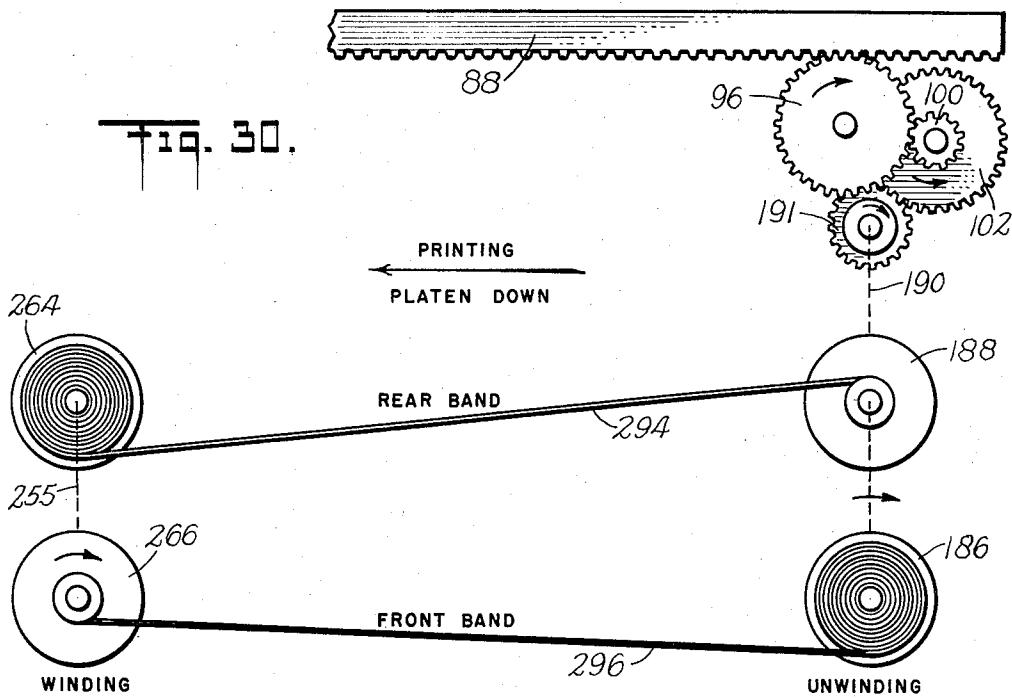
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PRINTING MACHINE

William H. Uhl, Penfield, and Harry G. Jones, Canandaigua, N.Y., assignors to Commercial Controls Corporation, Rochester, N.Y.

Application May 10, 1956, Serial No. 584,136

57 Claims. (Cl. 101—90)

This invention relates to a certain type of printing machine, more particularly to a machine capable of automatically printing a plurality aligned indicia such as letters and numbers on a card or the like.

One of the objects of this invention is to provide a printing machine which is sturdy, practical and simple in design. Another object is to provide a machine of the above character wherein the essential parts for accomplishing the desired results are reduced to an absolute minimum. Another object is to provide a machine of the above character which will automatically print a plurality of indicia on a long card. Another object is to provide a machine of the above character in which a plurality of printing rolls are used for the printing operation, together with means for conveniently setting the printing rolls as desired. Another object is to provide a machine of the above character which is easy to operate and consumes a minimum of space. Another object is to provide a machine of the above character which will print a large number of indicia on one card and yet utilize a small number of printing parts to accomplish this result. Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly comprises the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter set forth, and the scope of the invention will be indicated in the claims to follow.

For a fuller understanding of the nature and object of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which,

Figure 1 is a front perspective view of the machine ready for operation.

Figure 2 is a perspective view similar to Figure 1 but taken from a different angle and at the end of a printing operation.

Figure 3 is a top plan view of the entire machine with certain parts being broken away.

Figure 4 is a longitudinal vertical sectional view of the machine taken along the line 4—4 of Figure 3 showing the general relationship of the parts as the machine is set for a printing operation.

Figure 5 is a perspective view of the top printing ribbon supporting frame.

Figure 6 is a vertical sectional view on an enlarged scale and taken crosswise of the machine to show the setting and indicating wheels and associated mechanism.

Figure 7 is a fragmentary longitudinal vertical section of the printing and setting mechanism in the home position and taken along the line 7—7 of Figure 6.

Figure 8 is a fragmentary vertical section taken along the line 8—8 of Figure 7.

Figure 9 is a fragmentary horizontal section taken along the line 9—9 of Figure 7.

Figure 10 is a fragmentary horizontal section taken along the line 10—10 of Figure 7.

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Figure 11 is a fragmentary diagrammatic perspective view of the starting and locking levers and associated mechanism including several inter-locks.

Figure 12 is a fragmentary vertical section taken along the line 12—12 of Figure 10.

Figure 13 is a fragmentary vertical section taken along the line 13—13 of Figure 10.

Figure 14 is a fragmentary vertical section taken along the line 14—14 of Figure 10.

Figure 15 is a fragmentary vertical section taken along the line 15—15 of Figure 10.

Figure 16 is a fragmentary vertical section taken along the line 16—16 of Figure 10.

Figure 17 is an end elevation of the machine with the cover removed, i.e. looking into the end of the machine from the left as viewed in Figures 1 and 2.

Figure 18 is a fragmentary vertical section taken along the lines 18—18 of Figure 17.

Figure 19 is a fragmentary horizontal section taken along the lines 19—19 of Figure 18.

Figure 20 is a fragmentary horizontal section taken along the lines 20—20 of Figure 18.

Figure 21 is a vertical section taken along the lines 21—21 of Figure 7.

Figure 22 is a fragmentary vertical section taken along the line 22—22 of Figure 21.

Figure 23 is a fragmentary horizontal section taken along the line 23—23 of Figure 22.

Figure 24 is a fragmentary vertical section taken along the line 24—24 of Figure 22.

Figure 25 is an exploded perspective, partially schematic view of the printing wheels and associated mechanism for the vertical reciprocation thereof.

Figure 26 is a fragmentary vertical schematic view of the mechanism for locking the printing wheels during a printing operation.

Figure 27 is a fragmentary view similar to Figure 26 showing the parts in locked position.

Figure 28 is a fragmentary vertical sectional view showing the relationship of printing wheels and platen rollers when the printing wheels are in their lower position.

Figure 29 is a view similar to Figure 28 with the printing wheels in the upper or printing position.

Figure 30 is a diagrammatic view showing the drive for the printing carriage as the parts are related at the start of a printing operation.

Figure 31 is a diagrammatic view similar to Figure 30 showing these parts at the end of a printing cycle.

Similar reference characters refer to similar parts throughout the several views of the drawings.

As seen in Figure 1 the machine comprises an outer casing generally indicated at 10 which supports a printing ribbon 12 (Figure 3) wound on a pair of rollers 14 and 16 (Figure 4) which may be operated by knobs 18 and 20 to manually feed fresh printing ribbon to the printing surface as required. This printing ribbon lies between a card 22 (Figures 1, 2, 3, and 28) on which various numerals, letters and other indicia are to be printed by the printing mechanism to be described.

Still referring to Figure 1 there is a setting mechanism generally indicated at 24 for setting the printing wheels to the desired printing position. The printing wheels which will be described later are mounted in a carriage generally indicated at 26, and after the card is in place on top of the ribbon, proper setting has been effected and the motor started, this printing carriage moves from the right of the machine as shown in Figure 1, to the left of the machine as shown in Figure 2. During its travel throughout the length of the machine the printing mechanism to be described operates within the carriage 26 to print the desired indicia on the card 22, and when

the carriage reaches the position shown in Figure 2 at the left of the machine it automatically comes to rest. The card may then be removed and the travel of the carriage 26 is reversed so that it returns to assume the position shown in Figure 1 where it is ready for another printing operation for a resetting of its printing wheels as desired.

As can be seen in Figure 4 casing 10 includes two baseboards 28 and 30 located at opposite ends of the machine and connected to side plates 32 and 34 (Figures 6 and 17) which have inwardly extending bottom flanges 32a and 34a to which legs 36 (Figures 1, 2, and 4) are suitably connected. As will be understood from Figures 4, 7 and 21, carriage 26 comprises sides 38 and 40 connected by a top plate 42 and a bottom plate 44. This carriage is mounted to move longitudinally with respect to the machine on tracks 46 and 48 (Figures 7, 9, 17 and 21) suitably bolted to the machine side plates 32 and 34 (Figure 17). More particularly as seen in Figures 7, 21, and 22, plates 50 and 52 are connected to the sides 38 and 40 of carriage 26 by bolts 54 (Figures 7, 9, 22 and 23) and plates 50 and 52 carry rollers 56 on the opposite sides of tracks 46 and 48 to slidably support carriage 26 thereon.

Still referring to Figures 7 and 21, three platen rollers 58 are rotatably supported on arms 60 which are pivotally mounted between walls 38 and 40 of carriage 26 on a shaft 62 disposed therebetween. Thus the platen rollers 58 may be pivoted toward or away from the banks 64 and 66 of printing wheels which each comprise a series of individual wheels 64a and 66a, respectively, rotatably mounted on a shaft 68 (Figure 21). Platen rollers 58 are constantly urged away from the printing wheels 64a and 66a by springs 70 connected thereto and connected to a shaft 72 mounted in carriage 26 thereabove. Arms 60 and the platen rollers 58 rotatably mounted thereon may be urged toward the printing wheels 64a and 66a by cam arms 74 connected to a shaft 76 rotatably mounted in sides 38 and 40.

Referring now to Figures 7, 21, 22 and 25, printing wheels 64a and 66a are rotatably mounted on shaft 68 which is rotatably mounted in and spans the space between a pair of supporting levers 78 and 80 (Figure 21). These supporting levers 78 and 80 are interconnected by a rod 82 as can be seen in Figures 21 and 25; thus these levers move together as a unit to support banks 64 and 66 of printing wheels 64a and 66a. A pair of levers 84 and 86 are fixed to rod 82 (Figures 7, 21, 22, 25 and 26) and these arms are pivotally supported at the lower ends of supporting levers 78 and 80. As seen in Figures 7, 21 and 25, supporting levers 78 and 80 are supported in cut-away portions 38a and 40a of sides 38 and 40 (Figures 7 and 9) for vertical reciprocation as the carriage 26 moves from the Figure 1 position to the Figure 2 position during printing. Thus, machine sides 32 and 34 have upper inwardly extending flanges 32b and 34b and a pair of rack members 88 and 90 are supported thereon by bracket pieces 92 and 94. Rack members 88 and 90 have teeth 88a and 90a meshing with driving pinions 96 and 98 as seen in Figures 21 and 22. These pinions 96 and 98 drive other pinions mounted on the opposite sides of the machine to support and reciprocate the supporting levers 78 and 80 and hence the printing wheels 64a and 66a during a printing operation. Inasmuch as the structure on both sides of the machine is identical, that on the left as viewed in Figure 21 will be described. Referring to Figure 22, pinion 96 meshes with a pinion 100 which is rotatably mounted on side 38 and plate 50 of carriage 26; pinion 100 is fixed to a driving pinion 102 (see also Figure 23). Driving pinion 102 meshes with a pair of pinions 104 and 106 which as can be seen in Figures 23 and 24 are rotatably mounted on plate 50 of carriage 26. As will be understood from Figure 25 pinions 104 and 106 are eccentrically connected to supporting lever 78 by eccentric stud shafts 104a and 106a.

Accordingly, when the carriage 26 moves along the machine frame during a printing operation as described, rack 88 rotates pinions 96, 100 and 102, while pinion 102 meshes with and therefore rotates pinions 104 and 106.

Rotation of pinions 104 and 106 reciprocates supporting lever 78 within a cut-away portion 38a of side 38 (Figures 7 and 9). Inasmuch as supporting lever 78 and its counterpart, supporting lever 80, support shaft 68 and printing wheels 64a and 66a, vertical reciprocation is imparted to the printing wheels to effect a printing operation.

Turning now to Figure 21 printing wheels 64a and 66a are individually rotatable on shaft 68 being thus supported between collars 68a, 68b, 68c and 68d. Accordingly, these printing wheels are individually adjustable and they carry around their periphery a plurality of indicia such as numbers, letters, preferably in the form of rows of printing teeth 107 and 109 as seen in Figures 7 and 9. Mechanism is provided for setting printing wheels in corresponding positions in each bank simultaneously thereby to determine the lines of printing teeth 107 and 109 which will be set to face platen rollers 58 (Figure 7) for printing.

This setting mechanism includes a setting knob 108 and a setting bar 110 (Figure 1) extending from an opening 112 in the top of the casing. Beneath this opening are a series of indicator wheels generally indicated at 114 (Figures 4, 6 and 9) which are identical with printing wheels 64a and 66a and are arranged in corresponding positions as best seen in Figure 9 to be rotated with the printing wheels during setting. Inasmuch as these indicator wheels 114 are immediately beneath window 113 the operator may see exactly what he is doing to the printing wheels by looking into the opening where the same setting will appear on the indicator wheels. As seen in Figures 4, 6, 7 and 9 standards 116 and 118 are secured to baseboard 28 and a shaft 121 (Figures 6 and 7) extends therebetween to support indicator wheels 114. As previously noted indicator wheels 114 are in exact alignment with printing wheels 64a and 66a but they are rotatably mounted on the base of the machine and hence remain in fixed position at the right as viewed in Figure 4 during all phases of machine operation. On the other hand, the banks of printing wheels 64 and 66 are reciprocally supported in the carriage 26 to move from one end of the machine to the other as previously described during a printing operation. When carriage 26 is in its home position as shown in Figure 1, printing wheels 64a and 66a must be drivingly connected to indicator wheels 114 to rotate therewith. For this and other purposes to be described, there are provided a plurality of transfer pinions generally indicated at 122 (Figures 6, 7, 8 and 9), meshing with printing wheels 64a and 66a and indicator wheels 114.

These transfer pinions 122 are mounted on a shaft 124 which is supported in side plates 142 and 144 (Figure 6) and they are individually rotatable about shaft 124. As shown in Figure 7 they mesh with and are in alignment with printing wheels 64a and indicator wheels 114 (Figure 9). Accordingly, when transfer pinions 122 are rotated they rotate a printing wheel 64a and a corresponding indicator wheel simultaneously. Thus by manipulation of bar 110 and knob 108 the operator may achieve any setting desired. Further, as will be presently described, the corresponding wheel in each of banks 64 and 66 is simultaneously set so that wheels 114 give information concerning the setting in each bank. Referring to Figures 6 and 7 a plurality of detents generally indicated at 126 are pivotally supported on shafts 128 and 130 immediately beneath transfer pinions 122 and are urged thereagainst by an interconnecting spring 132. Thus transfer pinions 122, the printing wheels and indicator wheels, drivingly interconnected, as described, are held against idle rotation and the operator is given a sense of "feel" during setting. Also, because of the usual

detent snap action the printing wheels must be set with one line indicia teeth 107 and 109 exactly facing the platen roller 58.

Referring now to Figures 4, 6, 7 and 8 there are 2 setting wheels 134 and 136 splined to a shaft 138 and held thereon in spaced relation by a sleeve 140 (Figure 8). Shaft 138 is rotatably mounted on side plates 142 and 144 (Figure 6) extending from the baseboard 28. Sleeve 140 serves to hold wheels 134 and 136 adjacent the opposite ends of a setting frame generally indicated at 146 (Figure 8) which is slidably mounted on shaft 138 with the setting bar 110 secured thereto and extending upwardly through opening 112. Frame 146 is also slidably mounted on a bar 147 suitably screwed to the sides 142 and 144. As can be understood from Figure 8, sleeve 140 is of such length as to space wheels 134 and 136 so that each will mesh with corresponding transfer pinions 122a and 122b of each bank. Referring to Figures 6, 7, and 8, a spring detent generally indicated at 163 mounted on top 167 coacts with teeth 165 (Figure 1) on frame 146 to hold the frame in a set position, with wheels 134 and 136 in mesh with transfer pinions as described above.

Referring to Figures 6 and 7 a stop plate 141 extends from side 143 of frame 146 into the teeth of the indicator wheels 114. A slot 145 formed in the lower edge of plate 141 is the width of one wheel. Another stop plate 149 (Figure 7) extends into the teeth of transfer pinions 122 with slots 151 and 153 (Figure 6) located to fit over a corresponding pinion in each bank.

Accordingly it will now be seen that the operator in setting the machine first moves frame 146 by way of setting bar 110 to those transfer pinions meshing with the printing wheels in each of banks 64 and 66 which he wants to set. To facilitate this operation there is provided a scale 148 (Figure 3) adjacent opening 112 and bar 110 is provided with a pointer 150 coacting therewith. Corresponding information may be read directly on the indicator wheels 114 in conjunction with another scale 151 (Figure 3), adjacent opening 113. When the setting wheels 134, 136 are thus positioned in mesh with the desired pair of transfer pinions 132, slot 145 in stop plate 141 (Figure 6) and slots 151 and 153 in stop plate 149 will be located over the indicator wheel and transfer pinions which are to be set. Now, knob 108 (Figures 1, 3 and 8) is turned to rotate both indicator wheel and printing wheels to proper setting and all other wheels and pinions are held stationary by the stop plate. In this manner each of the printing wheels in the banks 64 and 66 may be conveniently set and the machine is then ready to make a plurality of impressions on the card as the carriage 26 moves from right Figure 1 position to left Figure 2 position.

It is of utmost importance to have the printing wheels 64a and 66a in mesh with the transfer pinions 122 before any setting otherwise the indicator wheels 114 could indicate a resetting which had not been accomplished and they would also be moved out of position so they would no longer be in identical relation with the printing wheels. Accordingly, provision is made for locking the setting mechanism until the printing wheels are in mesh with transfer pinions, i.e. until the carriage 26 has reached its home position all the way to the right as viewed in Figures 1, 4 and 7.

A pinion 154 (Figures 4 and 6) is keyed to shaft 138 and corresponds in shape and size to transfer pinions 122. A locking lever 156 is pivotally mounted on side 142 of the machine (Figure 4) and carries on its upper end a pin 158 for engagement with pinion 154. The other end 156a of locking lever 156 extends to the left as viewed in Figures 4, 11 and 22 into the path of a pin 162 (Figures 4 and 22) on the lower end of lever 84. A spring 164 (Figure 4) urges locking lever 156 toward pinion 154 and consequently when the machine is in operation with the carriage 26 away from its home position

pin 162 is disengaged from lever 156 allowing spring 164 to jam pinion 154 preventing any movement thereof. Because pinion 154 is interconnected with the setting wheels splined to shaft 138, no setting may take place. However, when the carriage returns to its home position, pin 162 on lever 84 (Figures 4 and 22) engages the underside of the lower end 156a of locking lever 156 to pivot it clockwise thereby removing pin 158 from pinion 154. The setting shaft 138 (Figures 7 and 8) is again free to be rotated when the machine is unlocked as will be presently described. However, additional interlocks providing additional safety measures against faulty operation are also provided and these will now be described.

To start the machine lock lever 166 must be turned in a clockwise direction, as viewed in Figure 1, and this lever is connected to a shaft 168 (Figures 10 and 11) rotatably mounted in the sides 32 and 34 of the machine. Such clockwise movement of shaft 168 cannot take place however unless the carriage 26 is in its home or right position as shown in Figure 4 because of a locking plate 170 (Figures 7, 10 and 11) which is pivotally supported on baseboard 28 by a screw 172. More particularly, locking plate 170 rests immediately above a slot 174 in baseboard 28, which is in alignment with an arm 176 fixed to shaft 168 and there is an upwardly extending ear 178 formed on locking plate 170 which is in alignment with the bottom 44 of carriage 26 as seen in Figures 7, 10 and 11. These parts are so proportioned and located that before the carriage 26 reaches its home position as shown in Figure 4, bottom 44 engages ear 178 to pivot locking plate 170 so that its end 170a moves away from slot 174 as the carriage comes to rest in its home position. This permits arm 176 to move into slot 174 as will be apparent in Figures 10, 11 and 15. Accordingly it will now be apparent that locking lever 166 may only move to its unlocked position when the carriage 26 is in its home position.

If the carriage 26 comes to rest a little short of its home position so that the printing wheels are not in mesh with the transfer pinions 122, there is provision for moving the carriage to its home position via locking lever 166. Referring again to Figures 10, 11 and 14, an arm 180 is fixed to shaft 168 and pivotally connected to a bar 182 which is pivotally connected to one end of 184a of a homing lever 184. Referring to Figures 7, 9 and 21 a pair of drums 186 and 188 are fixed to a shaft 190 which is rotatably supported on the sides 38 and 40 of the carriage 26; pinions 191 are fixed to the opposite ends of shaft 190 (Figure 9). Drum 188 has a pin 192 extending therefrom, as seen in Figures 11, 14 and 21, and this pin 192 is in the path of end 184b (Figure 11) of homing lever 184. Assuming that carriage 26 comes to rest short of its home position, which fact might not be apparent to the operator, upon turning the locking lever 166 to the right (Figure 1) to unlock the machine, arm 180 and bar 182 act to move lever 184 clockwise (Figures 11 and 14). Thus, end 184b thereof engages pin 192 to pull carriage 26 into its home position before arm 176 reaches locking plate 170. This same action would, of course, move locking plate 170 to expose slot 174 in the manner previously described.

As can be seen in Figures 11 and 22 and as previously described, lever 84 is pivotally connected to the bottom end of supporting lever 78 and a spring 194 (see also Figures 26 and 27) is connected therebetween to urge lever 84 clockwise. As seen in Figure 7, lever 86 is similarly related to supporting lever 80 by interconnecting spring 195. Levers 84 and 86 carry a locking bar 196, which as can be seen in Figures 7, 11 and 26, is located immediately beneath printing wheel banks 64 and 66. Accordingly when levers 84 and 86 are urged clockwise (Figure 11) by springs 194 and 195 or by other means, bar 196 fits between rows of printing teeth to lock the printing wheels. Thus the printing wheels are held in set

position during a printing operation while the carriage 26 traverses the length of the machine in the manner previously described.

As previously mentioned the pin 162 extends from the lower end of lever 84 as seen in Figures 11 and 22 and there is a similar pin 163 (Figure 11) on lever 86. Hook members 198 and 202 are connected to bar 168 to fit about pins 162 and 163 when the locking lever 166 is in its upper locked position. In this manner locking bar 196 is held against the banks of printing wheels 64 and 66 to lock them in the set position while the machine is at rest.

The printing wheels 64a and 66a must be held against rotation during a printing operation when hook members 198 and 202 are disengaged from pins 162 and 163. Of course, springs 194 and 195 partially accomplish this. However, mechanism for positively holding bar 196 in its locked position is provided. Inasmuch as such apparatus is identical, only that associated with the supporting lever 78 will be described in detail. Thus, as seen in Figures 22 and 25, supporting lever 78 has an extension 200 and a locking arm 204 is pivotally mounted thereon with a spring 206 mounted therebetween to urge the arm to pivot counterclockwise. A fixed pin 208 is crosswise of the machine in the path of the lower end of locking arm 204 and its counterpart on the other side of the machine. Pin 208 is so located that it pushes locking arm 204 to the position shown in Figures 22 and 26 when the carriage 26 is in its home or right position (Figures 1 and 4). However, when the carriage starts to move to the left, locking arm 204 moves away from pin 208 permitting spring 206 to snap the locking arm to a substantially vertical position as best seen in Figure 27, where its lower end 204a rests immediately above pin 162. In this position arm 204 holds lever 84 down locking pin 196 into the teeth of the printing rolls. Hence, as carriage 26 moves along the machine during a printing operation, the printing wheels 64 and 66 will be held locked against any rotation. Upon return to the home position pin 208 moves arm 204 and its counterpart on the other side to the left as viewed in Figures 22 and 26 to clear pins 162 and 163 (Figure 11).

Shaft 210 which is rotatably mounted in the sides 32 and 34 of the machine (Figure 10) must be turned counterclockwise by trip lever 212 (Figures 1, 10 and 11), to start the machine. However, such movement cannot be accomplished until the locking lever has been moved to its unlocked position. Thus as seen in Figures 11, 12 and 21 an arm 214 is connected to shaft 163 and has a pin and slot connection generally indicated at 216 with a slide 218. Slide 218 has a lower portion 218a (Figure 12) which is disposed beneath the machine and an upper portion 218b which rests on flange 32a (Figure 21) being held in this position by a screw and slot connection generally indicated at 220 (Figure 10). Referring now to Figures 10, 11 and 12 a hook-shaped arm 222 is connected to shaft 210 with its end 222a (Figure 12) immediately over an aperture 224 in flange 32a. These parts are so proportioned that end 222a must move into aperture 224 (Figure 11) in order for trip lever 212 to move far enough in a counter-clockwise direction to initiate a starting operation. When the locking lever 166 is in its locked position, slide 218 covers aperture 224 thus preventing the movement of trip lever 212 to a starting position. When the locking lever 166 is moved to the unlocked position as described above, slide 218 moves to the right as viewed in Figures 11 and 12 thereby exposing the aperture 224. Consequently after such unlocking movement by the locking lever it is possible to move the trip lever far enough to initiate the start of a printing cycle.

Movement of shaft 210 counter-clockwise (Figure 11) initiates a printing operation but in so doing, cam member 226 is also pivoted to move the platen rollers 58 (Figure 7) to their lower printing position by arms 74

in a manner now to be described. More specifically, cam member 226 engages a roller 228 (Figure 16) on the lower end of a platen release bar 230 which is pivotally mounted on the side 34 of the machine (Figure 21) on a stud shaft 232 (Figure 16). A spring 234 is connected to platen release bar 230 clockwise as viewed in Figure 16. Platen release bar 230 is also secured to side 34 of the machine near the top thereof by a pin and slot connection generally indicated at 236 (Figure 16). The upper end of platen release bar 230 has a cam member 238 connected thereto and in engagement with a roller 240 on the lower end of a link 242 pivotally mounted on the side 40 of carriage 26 as best seen in Figure 21. The upper end of link 242 is connected to an arm 244 (Figures 16 and 21) connected to shaft 76 which, as previously mentioned, carries the cam arms 74. Accordingly, these parts are so proportioned that when trip lever 212 (Figures 1 and 11) is moved to the starting position, cam member 226 pivots platen release bar 230 counterclockwise (Figure 16) to impart similar movement to arm 244 via link 242 pivoting in the opposite direction. This moves cam arms 74 counter-clockwise as viewed in Figure 7 thereby moving the roll supporting arms 60 to their lower position to place the platen rollers 58 in the printing position.

As seen in Figures 4, 11 and 13, an arm 246 keyed to shaft 210 has a pin and slot connection generally indicated at 248 with a shift bar 250 which is slidably mounted at the right (Figure 4) on bracket piece 252 suitably secured to the base of the machine and at the left by a cam piece 286 to be presently described. Thus upon movement of the trip lever 212 to the starting position shift bar 250 is moved to the right as viewed in Figures 4 and 11 which starts the printing operation in a manner which will now be described in detail.

Turning now to Figures 3 and 17, a motor 254 is suitably mounted on the side of the machine to drive a shaft 255 rotatably mounted in bearings 256 and 258 in angle pieces 260 and 262 secured to baseboard 30 of the machine. A pair of driving drums 264 and 266 are rotatably mounted on shaft 255, these drums being independently rotatable but clamped against friction members 268a and 268b. A bar 269 (Figures 17 and 18) fixed to angle pieces 260 and 262 extends through the friction members to anchor them against rotation. On the opposite or exposed faces of the drums 264 and 266 are a pair of clutch members generally indicated at 270 and 272 (see also Figure 18) facing clutch members generally indicated at 274 and 276 keyed to shaft 255 to rotate therewith but which may slide therealong. More particularly collar portions 275 and 277 are rotatably keyed in the upstanding leg portions 278a and 278b of a shift bracket 278.

Shift bracket 278 (Figure 17) is slidably held adjacent the base of the machine and it is connected to an arm 280 (Figures 17, 18 and 19) by a pin and slot connection generally indicated at 282. Arm 280 is connected to a stud shaft 284 rotatably mounted in machine base 30. Referring to Figures 18 and 20 stud shaft 284 is connected to a cam member 286 which in turn is pivotally connected to shift bar 250 to support the left end thereof (Figure 4) and to be pivoted by the shift bar in a manner to be described. Thus longitudinal movement of shift bar 250 as viewed in Figures 4, 7, 18 and 20 pivots stud shaft 284 in one direction or the other and such action moves shift bracket 278 (Figure 17) by way of arm 280 (Figures 18 and 19), either to the right or left as viewed in Figure 17. Thus either clutch members 270 and 276 or clutch members 272 and 274 interengage to drive either drum 264 or 266 against either friction members 268a or 268b.

As can be seen in Figure 20 cam member 286 has three cam surfaces 286a, 286b, and 286c and bell crank 288 is pivotally mounted on base 30 (Figures 17 and 20) with a roller 290 at one end engaging these surfaces;

a spring 292 is connected to the other end of bell crank 288 and anchored to the base 30 to constantly urge the roller 290 against these cam surfaces. Thus shift bar 250 may move and be held in any one of three positions all depending upon which cam surface, 286a, 286b, or 286c is engaged by roller 290. It will now be seen that when shift bracket 278 (Figure 17) is moved to the right, drum 264 will be driven in the direction of shaft 255 against friction member 268a while movement to the left results in interengagement of clutch members 272 and 274 to drive drum 266 in the same direction against friction member 268b.

As previously explained drums 186 and 188 (Figures 7, 9 and 21) are fixed to shaft 190 rotatably mounted in sides 38 and 40 of the carriage 26 (Figures 7, 9 and 21) and metal bands 294 and 296 are wound thereabout (Figures 4, 7, 9 and 18). More particularly, band 294 is wound about drum 264 (Figure 17) and drum 188 (Figures 9 and 21) while band 296 is wound about drum 266 (Figure 17) and drum 186 (Figures 9 and 21). As previously noted pinions 191 are connected to drums 186 and 188 via shaft 190 (Figure 9) and these pinions 191 mesh with driving pinions on the opposite sides of the machine such as pinion 102 (Figure 22). As previously explained this driving pinion 102 is in turn drivingly connected to rack 88 by way of pinions 100 and 96 and as seen in Figure 21 a similar pinion 98, similarly driven on the other side of the machine, meshes with the other rack 90. Thus drums 186, 188, 264, and 266, bands 294 and 296 (Figures 7, 9, 17, 21, 30 and 31) pinions 96 and 98, and racks 88 and 90 (Figure 22) are all drivingly interconnected. Consequently operation of the motor 254 rotates pinions 96 and 98 (Figure 21) to drive carriage 26 in either direction, as will be more fully described.

In Figures 30 and 31 there is a diagrammatic representation of this operation. Thus in Figure 30 the parts are shown as the carriage 26 is starting the printing operation shown from the Figure 1 position just after movement of trip lever 212 to the printing position. In this position, band 294 is practically unwound from drum 188 and wound on drum 264. The reverse is true on drum 186 with band 296 wound thereon and practically unwound from drum 266. Thus, as carriage 26 moves to the left (Figures 1, 4 and 30) drum 266 is rotated by the motor 254 in a clockwise direction. Drum 266 commences to wind band 296 from pulley 186 and this rotates drums 186 and 188 clockwise with shift 190 and pinion 191 to rotate pinion 102 and pinion 100 counter-clockwise (Figure 30). This rotates pinion 96 clockwise in rack 88 to move it and connected parts such as the carriage 26 to the left. As previously explained, drum 188 is also moving in a clockwise direction during this phase of the operation as it is carried to the left (Figure 30) by movement of carriage 26 to which it is connected. The tension on band 294 is so proportioned with respect to the friction between drums 264 and 266 as to allow slippage between these drums and hence winding of band 294 on drum 188 from drum 264. This slippage also allows drum 266 to wind an additional portion of band 296 from drum 186 to maintain proper hand tension. Finally when carriage 26 reaches the end of its travel to the left (Figure 2), the machine comes to a halt in a manner to be explained and the bands and drums are related substantially as shown in Figure 31. Thus band 296 is wound on drum 266 and unwound from drum 186 while band 294 is unwound from drum 264 and wound on drum 188.

As previously noted movement of trip lever 212 (Figure 1) counter-clockwise to the start position, similarly moves arm 246 (Figure 11) to move shift bar 250 to the right as viewed in Figures 4, 10, and 11. Of course, before starting the machine, a card to be printed upon is placed on the top of ribbon 12 (Figure 3) in a man-

ner to be more fully described hereinafter. Such movement of the shift bar pivots cam member 286 and stud shaft 284 counter-clockwise as viewed in Figures 19, and 20 thereby moving cam surface 286c in engagement with roller 290. Such counter-clockwise movement of stud shaft 284 moves arm 280 and shift bracket 278 to the left as viewed in Figure 17 thereby interengaging clutch members 272 and 274 to drive drum 266 in a clockwise direction as viewed in Figures 18 and 30. This results in the printing action while the carriage 26 moves to the left from the Figure 1 position to the Figure 2 position.

As seen in Figure 7, a post 298 extends from bottom 44 of carriage 26 and is bolted thereto. Post 298 is in the path of a bracket piece 300 (Figure 10) extending from the right end of shift bar 250 as viewed in Figure 4 and having an adjustable screw 302 facing the post. As seen in Figure 20, there is a bracket piece 304 at the other end of shift bar 250 which is also in the path of post 298 with an adjustable screw 306. Bracket piece 304 is so located and screw 306 so adjusted that near the end of the travel of carriage 26 to the left (Figures 1, 2 and 4), post 298 engages the end of screw 306 to move shift bar 250 to the left, thus moving cam member 286 clockwise (Figure 20) to move roller 290 from cam surface 286c to cam surface 286b, i.e. the neutral position. As previously noted, this shifts bracket 278 to disengage clutch members 272 and 274 so that driving action of drum 266 and related parts comes to a stop.

As previously described, platen rollers 58 (Figure 7) are lowered to their printing position when lock lever 166 is moved to the right to the unlock position. Thus, unless the platen rollers are raised from this position the entire length of the card in the machine will be printed, i.e. from the setting position of the carriage 26 as shown in Figure 1, to the left position seen in Figure 2. However, there are instances where printing is not desired throughout the full length of the machine. Accordingly, as can be seen in Figure 3, a pair of bracket members 308 and 310 extend from side 34 of the machine to support a bar 312 as by nuts 314 and 316. A stop member 318 (Figure 17) is slidably supported on bar 312 with a set screw 320 threaded therein so that it may be fastened as desired along the major portion of the length along the bar. A scale 322 (Figure 3) is suitably mounted on the top of the machine immediately beneath stop 318, the numbers 323 on scale 322 may indicate the number of printing impressions which will be printed on the card up to that point. Assuming the stop 318 to be positioned at some point intermediate the ends of bar 312 and fastened thereby set screw 320, the machine will operate by movement of the carriage 26 therealong in the manner previously described until roller 240 on link 242 (Figures 16 and 21) engages stop 318. This will move link 242 counter-clockwise as viewed in Figure 1 to move cam arms 74 to the position shown in Figure 7 allowing springs 70 to move platen supporting arms 60 and platen rollers 58 upwardly away from the printing position. Consequently no further printing takes place as carriage 26 completes its travel to the end of the machine.

When it is desired to return carriage 26 to the resetting position shown in Figure 1, i.e. from the left position, as shown in Figure 2 to the home position of Figure 1, trip lever 212 is moved to the right. This moves shift bar 250 to the left as viewed in Figures 4 and 10 imparting clockwise motion to cam member 286 (Figure 20) to move the roller 290 to cam surface 286a. This shifts bracket 278 (Figure 17) to the right causing interengagement of clutch members 270 and 276 which will drive drum 264 in clockwise direction (Figure 18) thereby imparting counter-clockwise motion to drums 188 as diagrammatically indicated in Figure 31. This drives pinion 191 counter-clockwise, pinions 102 and 100 clockwise and pinion 96 counter-clockwise along rack 88 resulting

in movement of carriage 26 to the right. Thus, drum 264 unwinds band 294 from drum 188 while band 296 is wound from drum 266 to drum 186. As carriage 26 nears its home or setting position (Figure 1), post 298 (Figures 7 and 11) engage screw 302 on bracket piece 300 to move shift bar 250 to the right. Such movement moves cam member 286 (Figure 20) in a counter-clockwise direction to snap roller 290 into the neutral cam surface 286b. Simultaneously bracket piece 278 moves into its neutral position disengaging clutch members 270 and 276 (Figure 17) thereby bringing the machine to rest.

Referring to Figures 3, 17 and 21, a beam 324 is centrally located between the sides of the machine (Figure 3) and more particularly between the sides of the banks 64 and 66 of printing wheels (Figure 21). A plurality of channel pieces generally indicated at 326 are suitably supported on the beam and in turn support type bars generally indicated at 328. Thus the type bars 328 are located between the banks of printing wheels and extend throughout the length of travel of the carriage. As can be seen in Figure 21 there is a platen roller 58a immediately above the type bars and accordingly printing will take place along the length of the card from the type bars to the card as long as the platen rollers remain in their printing position.

Referring to Figures 3 and 4, as previously described, the printing ribbon 12 stretches between rollers 14 and 16. More particularly as seen in Figure 4, roller 16 is suitably disposed within casing 332 at the right of the machine and adjacent the upper portion of carriage 26 carrying the platen rolls 58. Thus roller 16 may be adjusted by knob 20 (Figure 1) and the ribbon 12 feeds downwardly therefrom under a bar 334 (Figure 7) and then along the top of the machine to the other end thereof as will be described more fully presently. At the other end of the machine or the left end as viewed in Figure 4, a casing generally indicated at 336 having a top 338 (Figure 17) and sides 340 and 342 rests upon a pair of bracket members 344 and 346 which are suitably secured to the top flange portions 32b and 34b on sides 32 and 34. Tape roller 14 is rotatably mounted in bracket pieces 344 and 346 and extends therethrough for connection with knob 18 (Figures 1 and 17). As best seen in Figure 17, a bar 348 spans the space between bracket members 344 and 346 being secured thereto by screws 350. Accordingly, the ribbon from roller 16 at the other end of the machine passes under the bar 348 and thence upwardly to be wound about roller 14. A spring 352 on roller 14 is interposed between bracket piece 344 and a collar 355 to press against a washer 356 or the like, all as shown in Figure 17, to thereby provide desirable frictional resistance against rotation of roller 14 to hold the ribbon in position during printing; a suitable frictional spring 353 of similar construction (Figure 6) is provided in association with roller 16 for the same purpose. Referring to Figures 3, 17 and 21, ribbon 12 extends between the two rolls 14 and 16, or more particularly from bar 334 (Figure 7) to bar 348 (Figure 17). Ribbon 12 is also sufficiently wide to span the space between and rest upon side members 362 and 364 (Figure 21) and is thereby disposed between the card to be printed and type bars 328 and the banks 64 and 66 of printing rolls as the carriage 26 moves along during printing.

Portions of the ribbon on the opposite sides of type bars 328 would tend to sag down into the machines when not supported by the type rolls and accordingly supporting structure is provided as will now be described.

Referring to Figures 4 and 5 a standard generally indicated at 358 (Figure 4) extends upwardly from baseboard 30 to support beam 324 on the left and a rectangular track-frame generally indicated at 360. More particularly frame 360 (Figure 5) comprises side members generally indicated at 362 and 364 each of which includes

inter-fitting channel pieces 362a and 362b and 364a and 364b. Side members 362 and 364 rest upon and are connected to an angle bar 366 at the left end as viewed in Figure 5 while an end piece 368 rests upon and interconnects the opposite ends of side members 362 and 364.

Frame 360 is mounted on the top of the machine between casings 332 and 336 (Figure 4) and side flanges 32b and 34b (Figure 3). It is supported in this position on standard 358 at the left and on a transverse supporting standard 370 at the right (Figures 4, 6 and 7). As can be seen in Figures 17 and 21 the inner channel pieces 362b and 364b rest on the bottoms of the outer channel pieces 362a and 364a, leaving space between the upper flanges of the respective channel pieces on each side to thereby provide longitudinal tracks, 372 and 374 (Figure 17) at the opposite sides of the machine (see also Figure 21). Tracks 372 and 374 slidably support a plurality of ribbon supporting plates generally indicated at 376 (Figures 3 and 17) as will now be described in greater detail.

More particularly, these plates 376 are four in number as shown in Figures 3 and 17, i. e. plates 378, 380, 382 and 384. These plates are constructed and arranged to be slidably mounted in frame 360 to slide in the side member 362 and 364 (Figure 5). Thus plate 378 is secured to carriage 26 as shown in Figure 3 and plates 380, 382 and 384 are slidably related to plate 378. Consequently when the carriage 26 moves to the left as viewed in Figures 3 and 4 during a printing operation, plate 378 moves therewith and finally it picks up plate 380 which fits thereunder. Plate 380 next picks up plate 382 thereunder in the same manner, and so on finally to plate 384. As the carriage 26 reaches its position at the left of the machine as shown in Figure 2, the plates are to the right of the carriage 26.

Turning to Figure 3, plate 378 has downwardly depending flanges 386 and 388 which are connected in any suitable manner to carriage 26. Extending from flanges 386 and 388 and fixed thereto are a pair of pins 390 and 392 which at their left ends as viewed in Figure 3 are threaded through holes in the downwardly depending flanges 394 and 396 on plate 380. At the end of these pins 390 and 392 are retaining collars 390a and 392a to prevent the flanges 394 and 396 from riding off the ends of the pins 390 and 392. Thus, pins 390 and 392 may move relative to plate 380. A pair of pins 398 and 400 are affixed to flanges 394 and 396 of plate 380 and as seen in Figure 3 are spaced in staggered relation from pins 390 and 392. These pins 398 and 400 extend to the left and are threaded into holes in depending flanges 402 and 404 on plate 382. Thus pins 398 and 400 may move with plate 380 by sliding through holes into depending flanges 402 and 404. Retaining collars 398a and 400a are affixed to the ends of pins 398 and 400. Affixed to depending flanges 402 and 404 are a pair of inwardly staggered pins 406 and 408 which extend to the left and are threaded in downwardly depending flanges 410 and 412 of plate 384. Retaining collars 406a and 408a are affixed to the ends of pins 406 and 408 on the left sides of depending flanges 410 and 412 as best seen in Figure 17.

As can be seen in Figures 3 and 17, a series of laterally extending studs 414 appropriately connected to each of the plates 378, 380, 382 and 384 to extend inwardly into longitudinal grooves 416, formed in longitudinal beam 324. During printing operation the carriage 26 moves to the left and gradually picks up these supporting plates 376. Thus plate 378 moves to the left with the carriage until flanges 386 and 388 engage flanges 394 and 396 when plate 380 starts to move to the left until flanges 394 and 396 engage flanges 402 and 404 when plate 382 moves to the left. Finally, flanges 402 and 404 engage flanges 410 and 412 and plate 384 starts moving, at which time they are nested, one upon the other and move as a unit until the carriage 26 comes to rest in the posi-

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tion shown in Figure 2 where the plates 376 occupy their nesting position at the end of a printing operation. When the carriage 26 is returned to the setting position, fixed plate 378 attached to the carriage, moves to the right until retaining collars 390a and 392a engage flanges 394 and 396 to start pulling plate 380 to the right, and this action continues to lay the plates out along the length of the machine until the carriage reaches its setting position of Figure 1. At this time the plates have assumed the same position shown in Figure 3 to support the ribbon and prevent sagging.

Card 22 (Figures 1, 2 and 3) which is to be printed rests upon the top of ribbon 12 during a printing operation and mechanism now to be described is provided for supporting and holding it firmly in this position. Referring to Figures 5 and 17, a flange piece 418 extends inwardly and is spaced above member 362. As can be seen in Figure 5 this flange 418 extends substantially throughout the length of the frame 360 and thus the card may be slipped into printing position by inserting it under the flange piece on top of the ribbon and beneath carriage 26 in the Figure 1 position. A stop 422 is provided at the right end of frame 360 (Figure 5) to aid in properly positioning the card for printing.

To hold the card in this position there is provided a spring-pressed clamp generally indicated at 424 (Figure 7) pivotally mounted on bar 334. The right end 426 of clamp member 424 is connected to a spring 428 which is suitably anchored to a pin 430 on the machine thus to urge the clamp in a counter-clockwise direction as viewed in Figure 7 so its clamping edge 432 moves down upon the card. However, a cam surface 434 of the clamp 424 is shaped to fit about hubs on shaft 62. Thus when the platen rollers are in their upper non-printing position, clamp 424 is held away from the ribbon so that a card may be inserted thereunder. When carriage 26 moves to the left during a printing operation the hubs on shaft 62 move away from cam surface 434 of the clamp to allow spring 428 to urge the clamp against a card in the machine; the card is thus held in position in the machine during a printing operation.

It will thus be seen that we have provided a thoroughly practical and efficient machine in which the several objects hereinabove referred to, as well as many others, are successfully accomplished.

Since certain changes may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

We claim:

1. In a printing machine, in combination, a longitudinal supporting frame, a carriage on said frame mounted for longitudinal reciprocable movement from one end position on said frame to another, means for moving said carriage along said frame, a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame between said printing wheels and platen roll, means for supporting a card to be printed beneath said platen roll and upon said ribbon above said printing wheels, mechanism for creating relative movement between said printing wheels and platen roll as said carriage moves along said frame away from said one end position, setting means including pinions located at said one end position, means adapted to drivingly connect said setting means to said printing wheels when said carriage is at said one end position, a ratchet wheel fixed to said pinions, a locking bar adapted to engage and lock said ratchet wheel, and mechanism on said carriage adapted to disengage said locking bar from said ratchet wheel when said carriage is at said one end position.

2. In a printing machine, in combination, a longitu-

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dinal supporting frame, a carriage on said frame mounted for longitudinal reciprocable movement from one end position on said frame to another, means for moving said carriage along said frame, a plurality of printing wheels rotatably mounted on said carriage, a platen wheel rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame between said printing wheels and said platen wheel, means for supporting a card to be printed beneath said platen wheel and upon said ribbon above said printing wheels, a rack on said frame, a gear on said carriage meshing with said rack, means interconnecting said gear with one of said printing wheels and adapted to impart relative movement to said printing wheels and said platen wheel as said carriage moves along said frame away from said one end position, setting means located at said one end position for setting said printing wheels including setting pinions, and locking means adapted to lock said setting pinions during printing and adapted to lock said carriage at said one end position and unlock said setting pinions simultaneously when said carriage is in said one end position.

3. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame between said printing wheel and platen roll, means for supporting a card to be printed beneath said platen roll and upon said ribbon above said printing wheels, mechanism for creating relative movement between said printing wheels and platen roll, means located at one end of said frame for setting said printing wheels when said carriage is immediately adjacent thereto, and means for locking said printing wheels against movement during the travel of said carriage along said frame.

4. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame between said printing wheel and platen roll, means for supporting a card to be printed beneath said platen roll and upon said ribbon above said printing wheels, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, and means slidably mounted on said frame for rotatably adjusting said printing wheels by rotating said pinions meshing therewith.

5. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame between said printing wheel and platen roll, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, means forming at least one setting pinion rotatably and slidably mounted on said frame to mesh with at least one of said pinions to thereby rotate the printing wheel in mesh therewith for setting.

6. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame between said printing wheel and platen

roll, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, a shaft rotatably mounted on said frame, a pair of spaced pinions keyed to said shaft and slidably mounted thereon, and means for sliding said pinions to mesh with two of said first-mentioned pinions to effect rotatable adjustment of corresponding printing wheels for setting thereof.

7. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of setting pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, and means for moving said carriage from said setting pinions at one end of said frame to the other end of said frame to effect printing on said card.

8. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, said printing wheels having gear-shaped teeth formed thereon for individual setting, setting means including a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, and means adapted to render said setting means inoperative unless said carriage is in proper position at said end of said frame with its printing wheels in mesh with said setting means.

9. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, and means for locking said printing wheels against rotation during movement of said carriage along said frame.

10. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, and a plurality of indicator wheels identical in size and shape with said printing wheels and rotatably mounted on said frame in mesh with said pinions.

11. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame between said printing wheel and platen roll, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, a plurality of indicator wheels rotatably mounted on said frame to mesh with said pinions, and means forming a window above said indicator wheels so that the exact position of said printing wheels during setting may be ascertained from the corresponding position of said indicating wheels.

12. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame and between said printing wheels and platen roll, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof located and shaped to mesh with said printing wheels, a plurality of indicator wheels rotatably mounted on said frame to mesh with said pinions, said indicator wheels and said printing wheels being identical, and means for locking said indicator wheels against rotation during movement of said carriage along said frame.

13. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame and between said printing and platen rolls, said printing wheels having gear-shaped teeth formed thereon for individual setting of the printing indicia being formed on the surface of such teeth, setting means including a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, a plurality of indicator wheels in mesh with said pinions, and means for locking all indicator wheels against rotation except the one corresponding to the printing wheel being set.

14. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame and between said printing and platen rolls, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels, a plurality of indicator wheels meshing with said pinions, and separate means for locking all indicating wheels and printing wheels against rotation during a printing operation.

15. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing rolls, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels when said carriage is in setting position at said end, setting means adapted to effect individual rotation of any of said pinions, means for moving said carriage to said setting position, and locking means for said wheels operable when said carriage is away from setting position.

16. In a printing machine, in combination, a longitudinal supporting frame, a carriage mounted on said frame for movement therealong, means forming a plurality of printing wheels rotatably mounted on said carriage, a platen roll rotatably mounted on said carriage opposite said printing wheels, means for supporting a printing ribbon on said frame and between said printing and platen rolls, said printing wheels having gear-shaped teeth formed thereon for individual setting, a plurality of pinions rotatably mounted on said frame adjacent one end thereof and shaped to mesh with said printing wheels when said carriage is in a setting position, means cooperating with said pinions to set said printing wheels, and

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means for moving said platen roll away from said printing roll during setting.

17. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage beneath said platen rollers, means supporting a printing ribbon on said frame between said rollers, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing, the combination of a plurality of supporting plates connected to said carriage beneath said ribbon and shaped to be slidably disposed along said frame beneath said ribbon as said carriage moves through a printing operation.

18. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage beneath said platen rolls, means supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a plurality of substantially flat nesting plates connected to said carriage and shaped to be disposed along said frame to support said ribbon by said carriage as it moves during a printing operation.

19. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in alignment with said platen rolls, means supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed on said ribbon and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a plurality of substantially flat nesting plates having depending flanges interconnected by longitudinally disposed and laterally spaced pairs of rods whereby upon movement of said carriage along said frame said rods and said flanges coact to pull said plates to positions along said frame to support said ribbon.

20. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in alignment with said platen rolls, means adapted to move said carriage longitudinally along said frame during printing, means for supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and said platen rolls during movement of said carriage along said frame to effect printing on said card the combination of means for automatically clamping said card in printing position when said platen rolls are moved to a printing position.

21. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage beneath said platen rolls, means for supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of means forming a plurality of longitudinally disposed type bars substantially centrally located

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on said frame, said bars being interposed between said printing rolls.

22. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in alignment with said platen rolls, means for supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card the combination of means for rotatably supporting said printing rolls in two banks which are laterally spaced from each other, and a plurality of longitudinally disposed type bars supported on said frame and positioned between said banks.

23. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation with said platen rolls, means supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed, means for imparting relative movement between said printing and platen rolls during movement to said carriage along said frame to effect printing on said card, the combination of means forming a setting mechanism at one end of the frame adapted to mesh with the printing rolls for setting them, means adapted to lock said setting mechanism in setting position with said printing rolls in mesh, and means adapted to lock said setting mechanism against operation when said setting rolls are not in mesh.

24. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation with said platen rolls, means supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card the combination of means for locking the setting mechanism during a printing operation, and means for locking said printing rolls against rotation during movement of said carriage along said frame.

25. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation with said platen rolls, means supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card the combination of setting mechanism for said printing wheels, means for locking said setting mechanism during a printing operation and means adapted to move said carriage from one end of the frame to the other end thereof to effect a printing operation.

26. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation with said platen rolls, means supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of setting mechanism for said printing rolls, means for locking said printing rolls against setting

during a printing operation and a lock-out mechanism disposed at the setting end of the frame adapted to be actuated by mechanism on said carriage when it reaches the setting position to unlock said setting mechanism.

27. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation with said platen rolls, means for supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card the combination of a support slidably disposed within said frame at the setting position and a pair of setting pinions mounted in said frame and adapted to fit in intermeshing relationship with said printing rolls to effect a setting of any individual wheel as desired.

28. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation with said platen rolls, means supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card the combination of a support slidably disposed within said frame at the setting position, a bank of indicator wheels rotatably mounted in said frame and corresponding exactly in size and location to said printing rolls and means interconnecting said printing rolls and indicating wheels to indicate the exact position of each printing roll.

29. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation with said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and said platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a pair of setting wheels, said printing rolls being divided to form a pair of banks of individually rotatable printing rolls, a support for mounting said setting wheels in spaced relation and slidable with respect to said banks of printing rolls, means forming an intermeshing connection between said setting wheels and said printing rolls whereby said setting wheels may be used to set corresponding printing rolls in each of said banks.

30. The combination defined in claim 29 in which there are transfer pinions meshing with each of said printing rolls and adapted to mesh with said setting wheels according to the setting wheel position as determined by said support.

31. The combination defined in claim 30 in which there are spring-pressed detents engaging said transfer pinions to facilitate proper positioning of the transfer pinions and printing rolls.

32. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of setting means disposed at a setting position on said frame, a support slidably disposed

within said frame at said setting position, said printing rolls having rows of teeth in their peripheries, and a plate extending from said support between said teeth on said printing rolls to prevent rotation of all but one printing roll at a time.

33. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of setting means disposed on said frame at a setting position, a support slidably disposed within said frame at said setting position, means forming teeth extending from the peripheries of said printing rolls, and a lock plate extending between the teeth of said printing rolls from said support and so shaped as to prevent rotation of all but one indicator wheel at a time.

34. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of means for setting said printing rolls, a support slidably disposed within said frame adjacent said setting means, means forming teeth extending from said printing rolls, and a lock plate extending between said teeth to prevent rotation of more than one printing roll at a time.

35. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted in said carriage in juxtaposed relation to said platen rolls, means supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a plurality of supporting arms pivotally mounted in said carriage, a shaft connecting said arms, said platen rolls being mounted on said shaft, a spring adapted to urge said arms and said platen rolls away from said printing rolls, and a cam arm adapted to urge said arms downwardly to move said platen rolls toward said printing rolls to the printing position.

36. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls mounted on said carriage in juxtaposed relation to said platen rolls, means supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a plurality of supporting arms pivotally mounted in said carriage, a shaft connecting said supporting arms, said platen rolls being mounted on said shaft, a spring adapted to urge said arms and said platen rolls away from said printing rolls, a cam arm adapted to move said supporting arms and said platen rolls toward said printing rolls, a start lever and means associated with said start lever adapted to move said cam arms to move said supporting arms and said platen rolls toward the printing

position when said starting lever is moved to the start position.

37. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted in said carriage in juxtaposed relation to said platen rolls, means supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and said platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a plurality of supporting arms pivotally mounted in said carriage, a shaft connecting said supporting arms, said platen rolls being mounted on said shaft, a spring adapted to urge said arms and said platen rolls away from said printing rolls, cam arms adapted to move said supporting arms and said platen rolls toward said printing rolls, a start lever, means associated with said start lever adapted to move said cam arms to move said supporting arms, and means for locking said printing wheels against rotation during printing while the carriage is moving along said frame.

38. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing wheels rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a plurality of supporting arms pivotally mounted in said carriage, a shaft connecting said supporting arms, said platen rolls being mounted on said shaft, a spring adapted to urge said supporting arms and said platen rolls away from said printing rolls, cam arms adapted to move said supporting arms and said platen rolls toward said printing rolls, a start lever, means associated with said start lever adapted to move said cam arms to move said supporting arms toward said printing rolls, a motor, a clutch element adapted to be driven by said motor, drive means for moving said carriage along said frame associated with said clutch element and means associated with said starting lever for inter-engaging said clutch element and said drive means to move said carriage through a printing operation along said frame.

39. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and said platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a motor, a clutch adapted to be driven by said motor, drive means associated with said clutch and said carriage, said clutch having two elements adapted to drive said carriage in opposite directions, a start lever adapted in one position to connect said motor to one of said elements to drive said carriage through a printing operation and in another position to connect said motor with the other of said elements to move said carriage back to the setting position after a printing operation.

40. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said

printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a shaft rotatably mounted in said frame, a lock lever connected to said shaft, and lock means associated with said shaft to prevent rotation thereof to an unlock position unless said carriage is in its setting position on said frame.

41. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a lock lever, and means associated with said lock lever adapted to engage said carriage to move it to its setting position when said lock lever is moved toward the unlock position.

42. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rollers rotatably mounted on said carriage in juxtaposed relation to said platen rollers, means supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and said platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of setting mechanism for said printing wheels, a lock lever to unlock said setting mechanism, a shaft mounted on said frame and connected to said lever, and an arm on said shaft and adapted to engage said carriage to move said carriage to its setting position while said lock lever is being moved to the unlock position whereby said carriage is moved into setting position before said setting mechanism is unlocked.

43. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of setting mechanism for said printing rolls, a lock lever, means associated with said lock lever for locking said printing rolls against rotation and means associated with said printing rolls adapted to hold said last-mentioned means in its locked position during a printing operation.

44. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a shaft rotatably mounted in said frame, a lock lever connected to said shaft, and means associated with said shaft for lowering said platen rolls to a printing position when said lock lever is moved to its unlock position before said carriage starts to move along said frame.

45. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mount-

ed on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a motor, drive means including a clutch member connected with said motor and adapted to move said carriage along said frame, a clutch bar, a starting lever associated with said clutch bar to actuate the bar and thereby start movement of said carriage, and means associated with said carriage to engage said clutch bar to disengage the drive as said carriage reaches the other end of said frame.

46. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a motor, drive means including a clutch member connected with said motor and adapted to move said carriage along said frame, a clutch bar, a starting lever associated with said clutch bar to actuate the bar and thereby start movement of said carriage, a drum mounted on said carriage and belts connecting said drum to said driving means to effect movement of said carriage during a printing operation.

47. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a pair of tracks mounted on said frame, and rolls on said carriage interfitting with said tracks to support said carriage for movement longitudinally with respect to said frame.

48. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of rack means mounted on said frame, drive means mounted on said carriage intermeshing with said rack means, and means associated with said drive means for effecting said relative movement between said platen and printing rolls during movement of said carriage along said frame.

49. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame between said rolls, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of drive means including a pinion rotatably mounted on said frame, a pair of supporting levers, a shaft fixed to said supporting levers upon

which said printing wheels are rotatably mounted, a pair of pinions meshing with said driving pinions, and means forming eccentric connections between one of said supporting levers and said pinions whereby upon rotation of said pinions said supporting lever is reciprocated to reciprocate said printing rolls toward and from said platen.

50. The combination defined in claim 49 in which there are driving pinions rotatably mounted on the opposite sides of said frame and pairs of pinions meshing with each of said driving pinions and eccentrically connected to said supporting levers to effect said reciprocation of said printing rolls.

51. The combination defined in claim 50 in which the printing wheels have teeth and a pair of locking levers are pivotally mounted on said supporting levers and are interconnected by a locking bar adapted to fit within said teeth of said printing wheels to lock them against rotation, and spring means adapted to urge said locking levers in a lock position with said bar between said teeth during a printing operation when the carriage is moving along said frame.

52. The combination defined in claim 50 in which said spring means includes a pair of stop levers pivotally mounted on said supporting levers with springs adapted to urge said stop levers over pins on said locking levers to hold said locking levers in locked position when said carriage is moving along said frame.

53. In a printing machine including a frame, a carriage mounted for longitudinal movement along said frame, a plurality of platen rolls rotatably mounted on said carriage, a plurality of printing rolls rotatably mounted on said carriage in juxtaposed relation to said platen rolls, means for supporting a printing ribbon on said frame, means for supporting a card to be printed on said ribbon, and means for imparting relative movement between said printing and platen rolls during movement of said carriage along said frame to effect printing on said card, the combination of a rack on said frame, a pinion mounted on said carriage to mesh with said rack and having a driving connection with another pinion, means including a supporting lever adapted to rotatably mount said printing rolls, and a pair of pinions meshing with said last-mentioned pinion and eccentrically connected to said supporting lever whereby as said carriage moves along said frame said pinions rotate to reciprocate said supporting lever and hence said printing rolls.

54. The combination defined in claim 53 in which there are a pair of said supporting levers connected to the shaft upon which said printing rolls are rotatably mounted and there are pairs of said pinions rotatably mounted on the opposite sides of said carriage with a pair of racks so mounted on said frame so as to effect said reciprocation of said printing rolls as said carriage moves along said frame.

55. In a printing machine, in combination, a frame, a carriage mounted to move along said frame during a printing operation, a platen roller rotatably mounted on said carriage, printing wheels mounted on a shaft, a pair of supporting levers connected to the opposite ends of said shaft and disposed beneath said platen roller, pairs of pinions eccentrically mounted on each of said supporting levers, gears meshing with said pairs of pinions, and means for driving said gears whereby said supporting levers are reciprocated to move said printing wheels toward and from said platen rollers.

56. The combination defined in claim 55 including a locking bar pivotally mounted on said carriage to move toward and from a locking position with respect to said printing wheels, and levers pivoted on said carriage adapted to move toward and from a locking position with respect to said locking bars.

57. The combination defined in claim 55 in which there is a rack on said frame, and pinion means mounted on said carriage meshing with said rack and said pairs of

pinions whereby said pairs of pinions are driven to reciprocate said printing wheels when said carriage moves along said frame.

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