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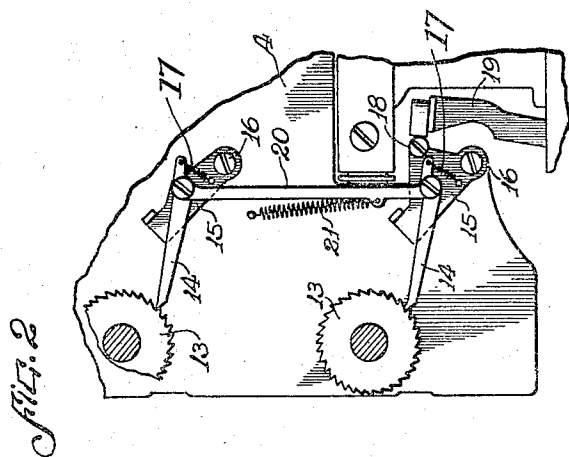
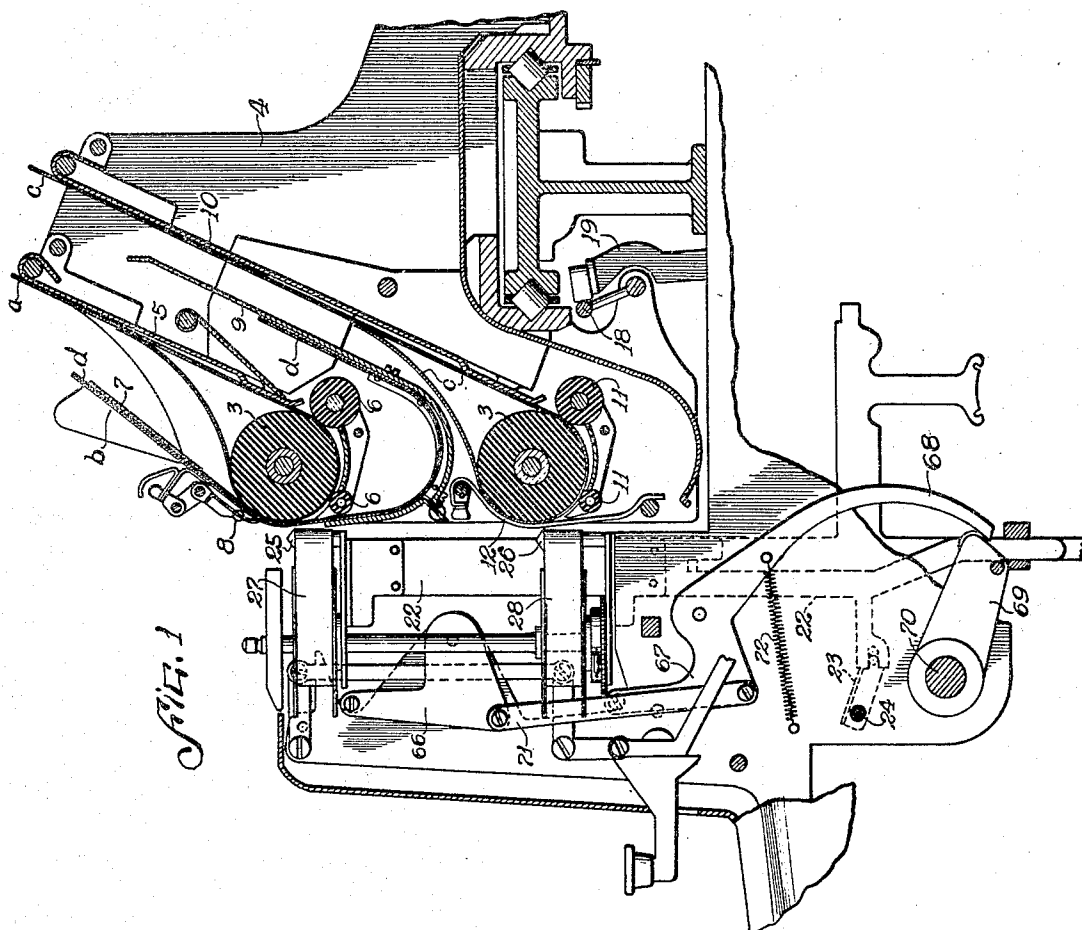
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DUAL PRINTING MECHANISM FOR COMPUTING MACHINES AND THE LIKE

Filed May 8, 1933

3 Sheets-Sheet 1



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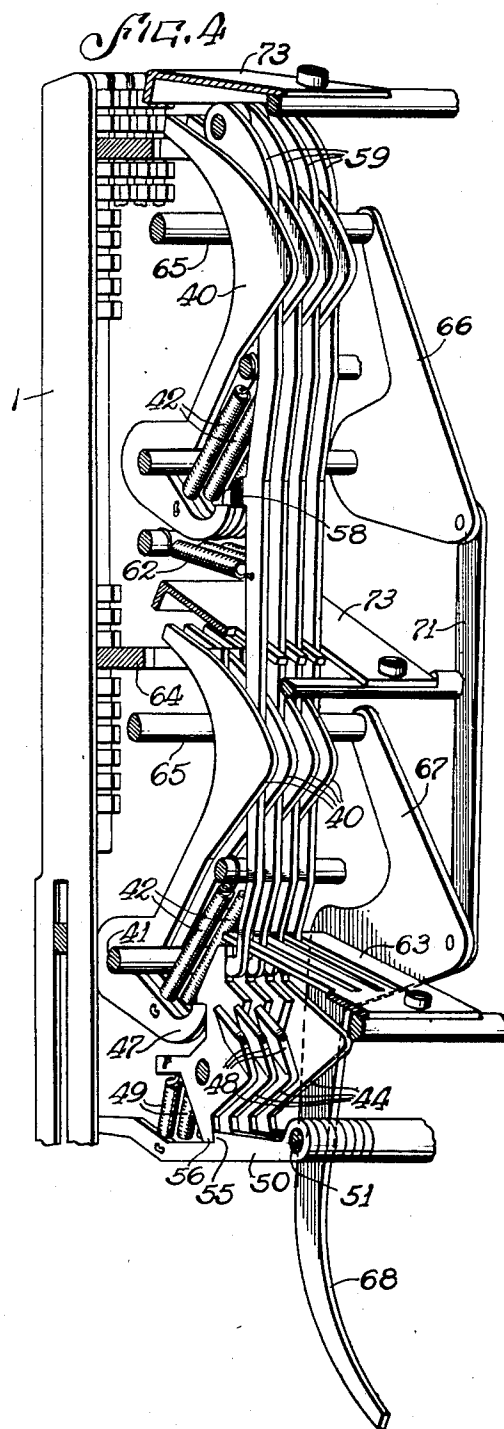
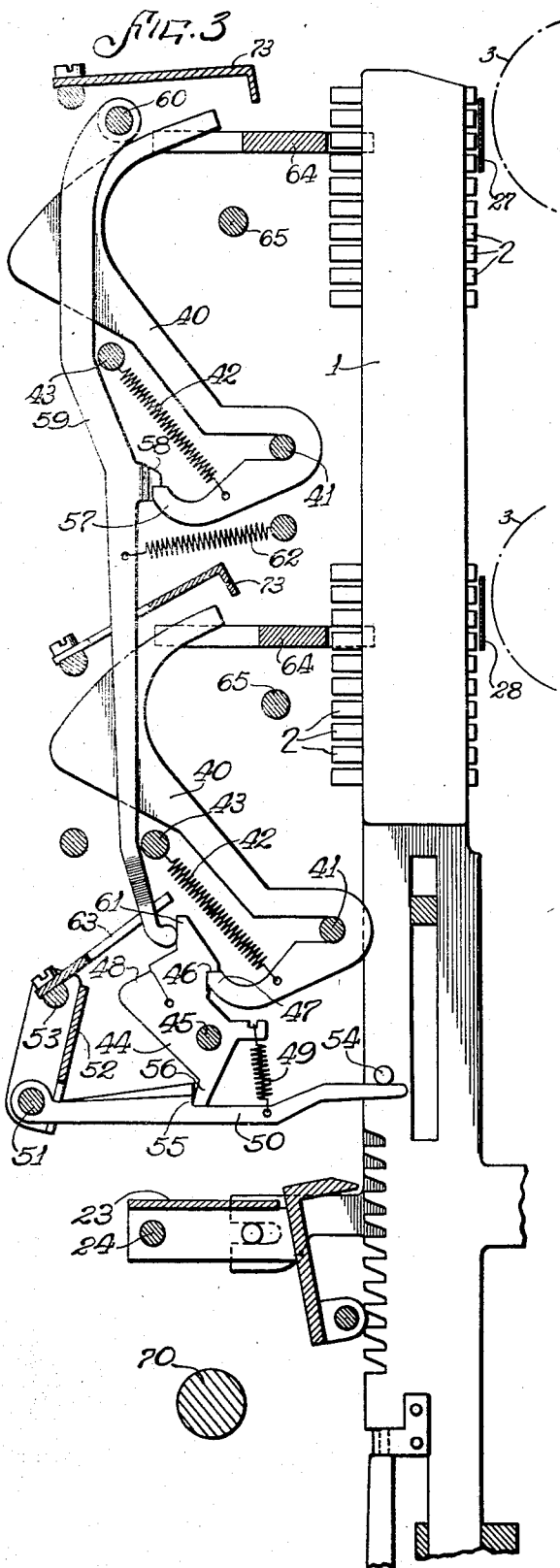
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3 Sheets-Sheet 2



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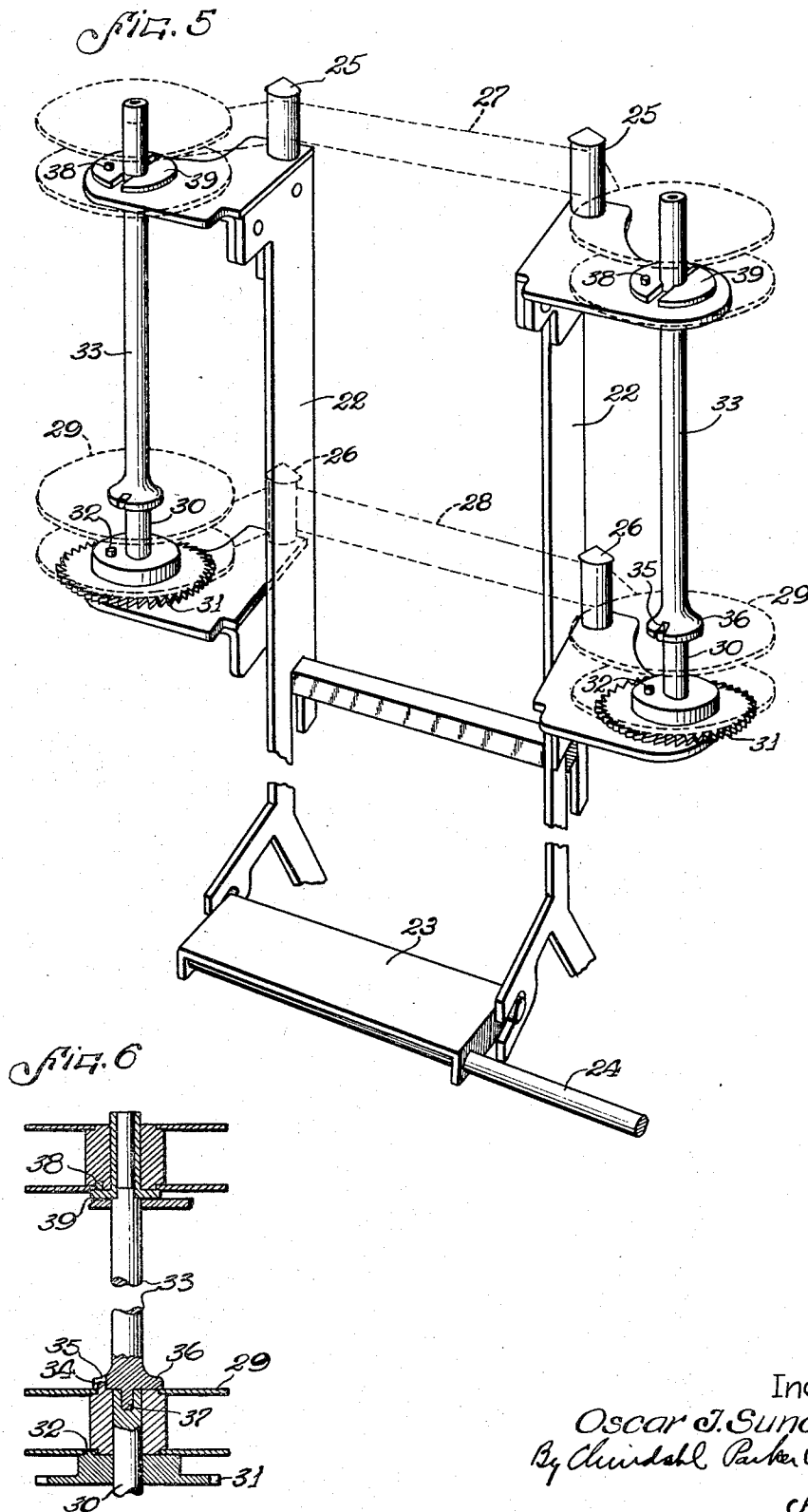
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DUAL PRINTING MECHANISM FOR COMPUTING MACHINES AND THE LIKE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,089,447

DUAL PRINTING MECHANISM FOR COMPUTING MACHINES AND THE LIKE

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Application May 8, 1933, Serial No. 669,853

19 Claims. (Cl. 101—93)

This invention relates to means for producing duplicate imprints, as, for example, upon a ledger sheet and a journal sheet. The object of the invention, generally stated, is to provide a dual printing mechanism which is capable of a wide variety of uses, which will permit of duplicate imprints without the use of carbon paper, and which is very simple and compact. The invention also contemplates novel and advantageous means for introducing and feeding the work-pieces.

In the accompanying drawings,

Figure 1 is a fragmental vertical sectional view illustrating one of various possible embodiments of the present invention. The parts are shown in the initial or normal position.

Fig. 2 is a fragmental end view of the paper carriage, showing the line-space mechanism, the parts being represented in the position occupied during the movement of the platens.

Fig. 3 is a fragmental vertical sectional view, the units type bar being illustrated as elevated into printing position, the hammers being about to be released.

Fig. 4 is a perspective view of the mechanism shown in Fig. 3.

Fig. 5 is a perspective view of the means for raising and lowering the ribbons.

Fig. 6 is a fragmental sectional view showing the means for driving the ribbon spools.

The invention is herein shown as embodied in a machine of the character disclosed in my application Serial No. 581,800, filed December 18, 1931, to which application reference may be made for an understanding of parts not herein illustrated and described, but it will be understood that the invention may be embodied in machines of various other forms.

The type bars may partake of various forms and may be supported and actuated in various ways. In the present drawings, the type bars are arranged compactly side by side and have a rectilinear vertical movement. The type bar farthest to the right may be utilized for printing signals or symbols. Each type bar carries an upper and a lower group of type 2 arranged to make impressions upon paper carried by two cylindrical platens 3. These platens are rotatably supported in a laterally movable or cross-tabulating paper carriage 4. With the upper platen may be associated paper-guiding and feeding means which is preferably, although not necessarily, similar to the equipment fully disposed in my application Serial No. 610,043, filed May 9, 1932.

In the embodiment herein shown, 5 is a rear paper table for the insertion of a work-piece a

from the rear of the upper platen, 6 being paper feed rolls for feeding such a work-piece beneath and up in front of the platen. 7 is a paper table which may be supported in the manner fully disclosed in said application Serial No. 610,043, for the purpose of introducing a work-piece b, face forward and bottom edge foremost, down past the front of the upper platen. 8 is one of several paper feed rolls to cooperate with the upper platen in feeding the work-piece b. 9 is a guide or shield to guide the normally lower portion of the work-piece b below and to the rear of the upper platen.

The lower platen is provided with a paper table 10 for use in inserting a work-piece c rearwardly beneath the platen. Feed rolls 11 serve to feed the work-piece c under and up past the front of the platen. 12 is a guide member supported in the paper carriage for guiding the normally upper edge of the work-piece c around the front of the platen.

The work-pieces a, b, and c may be of any nature suited to the work in hand. For example, the work-pieces a and b may be a ledger sheet and a statement, a sheet of carbon paper d being inserted with the sheet b. The work-piece c may be a journal, record or audit sheet, which remains in the machine while entries are being posted to a number of ledger sheets. When only one work-piece is to be printed upon by each of the sets of type, it will be evident that carbon paper is unnecessary.

While I have herein shown cylindrical platens and paper-inserting and feeding means especially designed to cooperate with cylindrical platens, it should be understood that the invention may be used in connection with other forms of platens and work-piece-handling equipment, as, for example, means for supporting a savings bank book.

The platens may be rotated for line-spacing or other purposes in any preferred manner. Herein I have a ratchet wheel 13 (Fig. 2) affixed to each platen, and a pawl 14 for each ratchet wheel, each pawl being pivoted to an arm 15 which is pivoted at 16 to an end wall of the carriage. Springs 17 normally hold the pawls in position to engage the ratchet wheels. The lower arm carries a bar 18 which in all positions of the carriage may be engaged by a pivoted actuating arm 19. The upper arm 15 is caused to move in unison with the lower arm through the medium of a link 20. A spring 21 returns the dogs to their normal rear position when the arm 19 swings rearwardly.

The means for supplying ink for use in mak-

ing impressions of the type upon the work-pieces may be of any desired nature, although the construction herein shown possesses important advantages. Referring to Fig. 5, it will be seen that the ribbon spools and ribbon guides are carried upon two slides 22 which are mounted in the machine frame for vertical reciprocation for color-shift purposes and for the purpose of exposing the imprints. The slides 22 are raised and lowered by means including a wide arm 23 fixed upon a rock shaft 24. 25 and 26 are guides for the upper and the lower ribbons 27 and 28, respectively. The lower spools 29 are mounted upon vertical shafts 30 rotatably mounted on the slides 22. Fixed to each of said shafts is a ratchet wheel 31 which may be turned intermittently by any conventional or preferred mechanism (none being herein shown). The lower spools are caused to turn with the ratchet wheels 31 through the medium of studs 32 on the ratchet wheels, which studs enter recesses in the spools, as shown in Fig. 6.

The upper spools are mounted on shafts 33 which are respectively aligned with the shafts 30 and are arranged to rotate therewith by any preferred means. Herein I have shown each of the lower spools as having a stud 34 adapted to enter a notch 35 in a flange 36 on the shaft 33. On the lower end of the shaft 33 is a centering stud 37 (Fig. 6) adapted to fit in an axial socket in the shaft 30. The upper spool is connected to revolve with the shaft 33 by means herein shown as consisting of a stud 38 attached to a flange 39 which is rigidly connected to the shaft 33, said stud entering a socket in the lower side of the spool, as shown in Fig. 6.

Two sets of hammers are provided, one for the upper and the other for the lower group of type. While these hammers may be of any desired construction, they are herein shown as similar to those disclosed in said application Serial No. 581,800. The hammers 40 of each set are pivoted on an axis 41 and are impelled against the type by individual springs 42 that are anchored to a rod 43. For each hammer of the lower set there is provided a latch 44 pivoted at 45 and having a shoulder 46 to engage a lug 47 on the hammer. As shown in Fig. 4, the latch 44 for each of the hammers except the hammer for the signal type bar may have a lug 48 overlying the latch next to the left so that the actuation of any latch will actuate all the latches of lower order. The latches are normally held in engagement with the hammers by means of individual springs 49 which are connected to trip arms 50. The arms 50 are pivoted on a rod 51 carried by a plate in the nature of an actuating arm 52 pivoted at 53. The springs 49 serve to hold the free ends of the trip arms 50 in contact with pins 54 on the respective type bars. When the type bar is raised sufficiently to bring the type for the digit "1" or any higher digit to the printing line, a shoulder 55 on the arm 50 is brought in front of a lug 56 on the latch 44. It will thus be seen that when any of the type bars are raised into position to print "1" or a higher digit, rearward movement of the corresponding arms 50 will cause the shoulders 55 to engage lugs 56 on the latches 44 and thus disengage the corresponding latches from the hammers required for printing from the raised type bars.

The upper set of hammers is herein shown as being controlled by the latches 44 for the lower set of hammers. Each of the upper hammers has

a lug 57 which is normally engaged by a lug 58 on an arm 59 that is pivoted at 60. The arm 59 extends downwardly into position to engage a lug 61 on the latch 44 for the corresponding hammer. A spring 62 normally holds the arm 59 in engagement with the latch 44 and with the lug 57. It will be seen that when any latch 44 is operated to release a hammer in the lower set of hammers, the corresponding hammer of the upper set also will be released.

The lower ends of the arms 59 are held against sidewise displacement by means of a comb plate 63 fixed, for convenience, to the pivot rod 53. Guide plates 64 are provided for the hammers.

In the latter half of a cycle of operations of the machine, the hammers are retracted or cocked by means of resetting rods 65. The upper rod 65 is carried by two bell crank levers 66 (only one of which levers is shown in the present drawings), said levers being pivoted on the axis 41. The lower rod 65 is carried by similar levers 67. The levers 67 have cam extensions 68 arranged to be operated by arms 69 on the main rock shaft 70 of the machine. The upper rod 65 is caused to move in unison with the lower rod by means of a link 71. A spring 72 (Fig. 1) withdraws the rods 65 from the hammers during the first half of the cycle.

Any desired non-print mechanism may be provided. Herein I have shown hammer detents 73 similar to the one described in application Serial No. 581,800.

The operation of the printing mechanism will be readily understood from the foregoing description. It will be seen that the platens 3 may be of any desired length and can be utilized throughout their length. Sheets and tapes may be fed to the platens side by side and printed upon in any desired columnar or other arrangement. The construction is very compact and simple, one set of differential stops and one set of type-bar raising and lowering devices serving for both groups of type.

I claim as my invention:

1. The combination of a laterally movable paper carriage, two cylindrical platens rotatably mounted in said carriage, one above the other, means for introducing a journal sheet to the lower platen from the rear thereof, means for introducing a ledger sheet, lower edge foremost, in front of the upper platen, a set of type bars each having two groups of type for printing upon said platens, two ribbons, one for each group of type, two sets of hammers, one set for each group of type, and means for operating the hammers in unison.

2. The combination of a laterally movable paper carriage, two platens mounted in said carriage, means for introducing a work-piece to the lower platen, means for introducing a work-piece to the upper platen, one set of type bars each having two groups of type for printing upon said platens, means for supplying ink to the type, two sets of hammers, one set for each group of type, and means for operating the hammers in unison.

3. The combination of a laterally movable paper carriage, two cylindrical platens rotatably mounted in said carriage, one above the other, means for introducing a journal sheet to the lower platen from the rear thereof, means for introducing a ledger sheet, lower edge foremost, in front of the upper platen, and means for simultaneously printing upon both work-pieces.

4. The combination of a laterally movable pa-

per carriage, two cylindrical platens rotatably mounted in said carriage, a set of type bars each having two groups of type for printing upon said platens, means for supplying ink to the type, two sets of hammers, one set for each group of type, and means for operating the hammers.

5 5. The combination of a laterally movable paper carriage, two cylindrical platens rotatably mounted in said carriage, one above the other, a set of type bars each having two groups of type for printing upon said platens, means for supplying ink to the type, two sets of hammers, one set for each group of type, and means for operating the hammers in unison.

10 6. The combination of a laterally movable paper carriage, two platens mounted on parallel axes in said carriage, a set of reciprocatory type bars each having two groups of type for printing upon said platens, means for supplying ink to the type, and hammers for operating the two groups of type in unison.

15 7. In a dual printing mechanism, two platens, two sets of ribbon spools and ribbon guides, and means for simultaneously moving the spools and guides with relation to the platens.

20 8. In a dual printing mechanism, two platens on parallel axes, one above the other, two sets of ribbon spools and ribbon guides, one set for each of the platens, and means for simultaneously moving the spools and guides with relation to the platens.

25 9. In a dual printing mechanism, two sets of ribbon spools, one set being located above the other, lower shafts on which the lower spools are removably mounted and by which they may be rotated, and two upper shafts, one for each of the upper spools, on which upper shafts the upper spools are removably mounted and by which they may be rotated, each of the upper shafts being alined with and detachably connected to one of the lower shafts.

30 10. In a dual printing mechanism, two sets of ribbon spools, one set being located above the other, lower shafts on which the lower spools are removably mounted and by which they may be rotated, and two upper shafts, one for each of the upper spools, on which upper shafts the upper spools are removably mounted and by which they may be rotated, each of the upper shafts having means to engage one of the lower shafts to aline it with such lower shaft, each upper shaft also having means to engage a lower spool so as to be driven thereby.

35 11. The combination of a laterally movable paper carriage, a plurality of platens mounted in said carriage, a set of type bars each having a plurality of groups of type for printing upon said platens and means for actuating said groups of type to make simultaneous imprints on said plurality of platens.

40 12. The combination of a movable paper carriage, a plurality of platens mounted in said carriage so as to move therewith, a plurality of groups of type operatively supported in a single group of type bars for printing upon said platens and means for actuating said groups of type to

make simultaneous imprints on said plurality of platens.

13. In a device of the character described, the combination of a pair of platens arranged in superposed relation with one another, a plurality of sets of type supported for coaction therewith, means for impelling the type against the platens, means whereby said platens may be adjusted longitudinally in unison, and means whereby the platens may be rotated for line feeding.

14. In a machine of the character described, duplicate sets of type, a carriage, platens arranged on the carriage and adapted to receive impressions from said type, means whereby the carriage and platens may be shifted together in such a manner that the platens remain in printing relation with the type, means for causing the sets of type to print duplicate records simultaneously, and means for imparting a step by step rotary movement to the platens while in their shifted positions.

15. In a machine of the character described, a plurality of sets of type, an operating mechanism therefor, a carriage, platens carried thereon and adapted for simultaneous longitudinal movement therewith, the said platens lying in position to receive impressions from selected type in the said sets, and line spacing means operatively connecting the platens and arranged with the operating mechanism for simultaneous step by step rotary movement of the platens.

16. In a machine of the character described, a traveling carriage, a plurality of platens carried thereon, a set of printing type for each of the platens, the type being connected for movement with one another in a vertical plane, means for simultaneously moving the type into printing contact with each of the platens, and line spacing means operatively connected with each of the platens for causing vertically alined printing thereon.

17. In a machine of the character described, a carriage, a plurality of rotatable platens supported for longitudinal movement therewith, a plurality of sets of type, and a set of type bars movable in a vertical plane for adjusting any of the type to coact with the platens.

18. In a machine of the character described, a carriage adapted to be moved in a path, a pair of platens arranged one above the other and supported for movement with the carriage, duplicate impression type adapted to coact with each platen, means so connecting the type that they may be adjusted for duplicate impressions, and means for actuating the type for taking simultaneous impressions therefrom.

19. In a dual printing mechanism, two groups of hammers, each hammer being individually impelled to action, individual latches for the hammers of one group, individual latches for the hammers of the other group, and a connection between the latches, whereby movement of the latches of one group operates the corresponding latches of the other group.

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