

July 11, 1939.

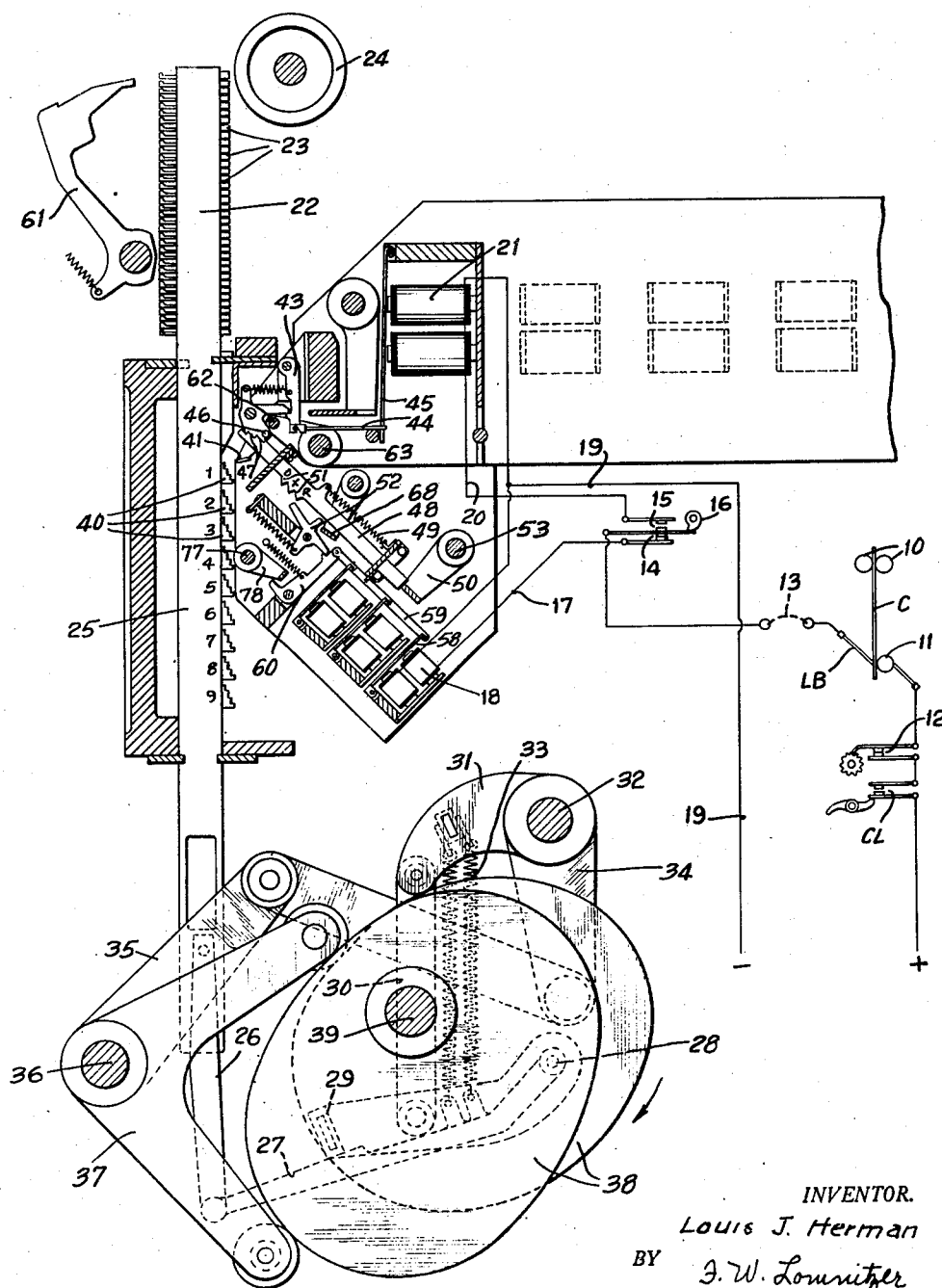
L. J. HERMAN
PRINTING MECHANISM

2,165,260

Filed June 26, 1937

3 Sheets-Sheet 1

FIG. 1



July 11, 1939.

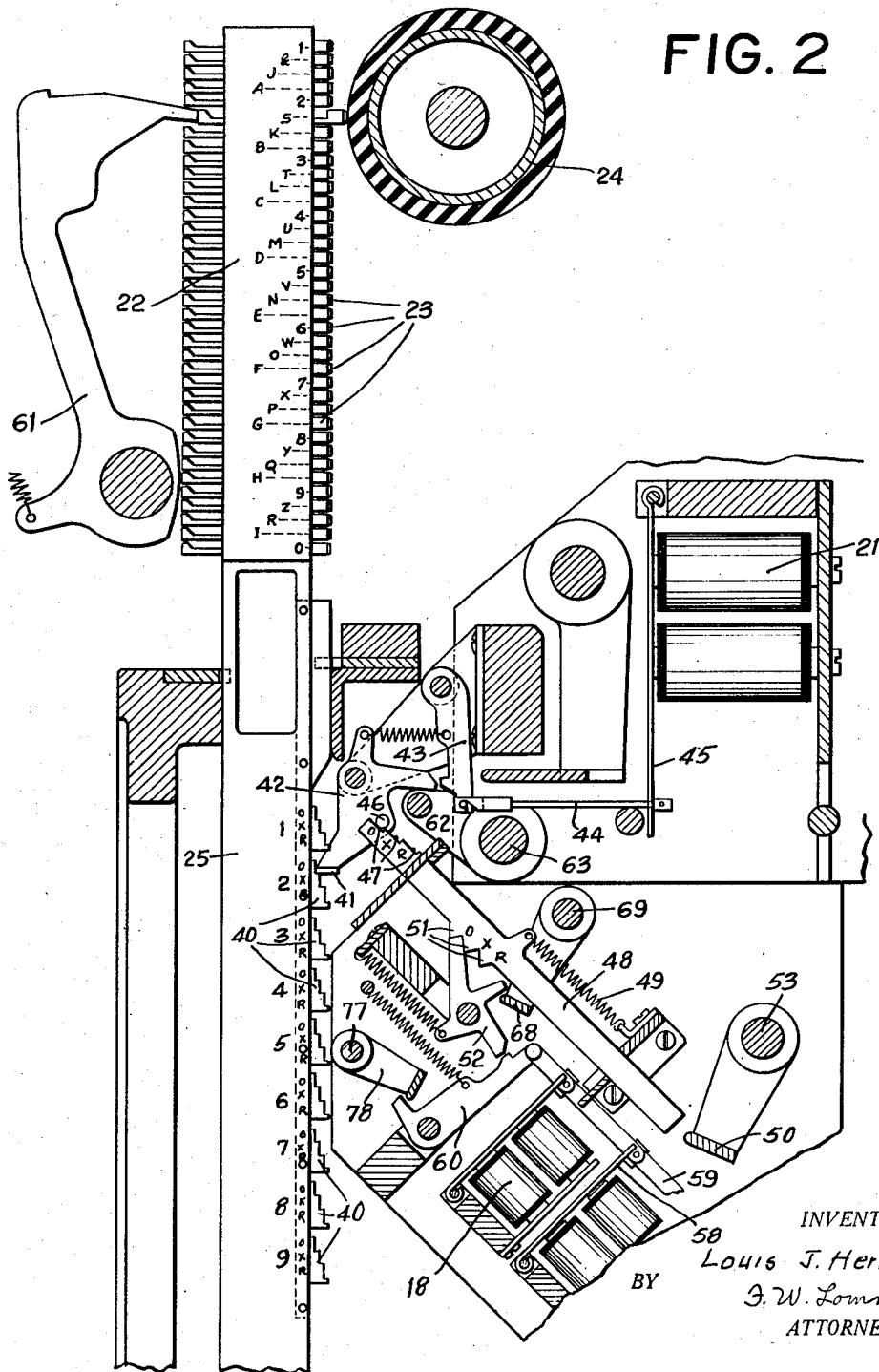
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FIG. 2



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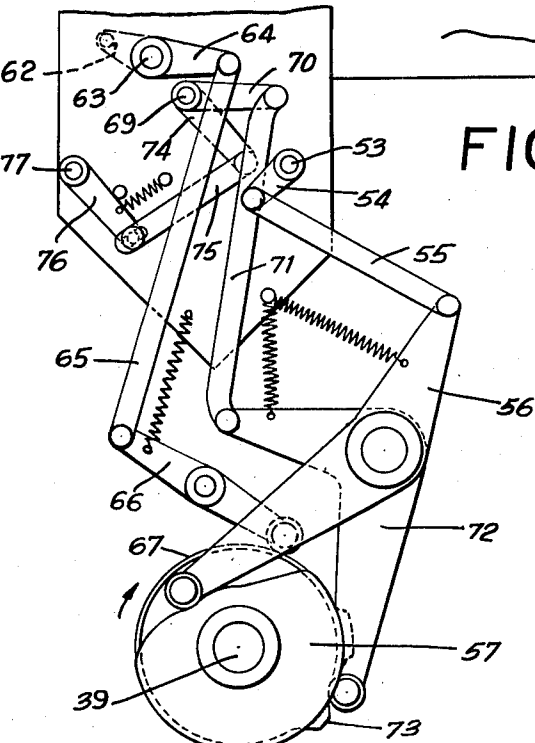
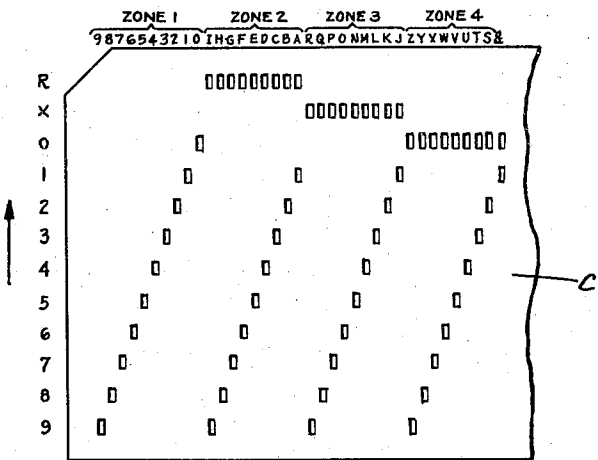


FIG. 3.

FIG. 4



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PRINTING MECHANISM

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5 Claims. (Cl. 101—93)

This invention relates to record card controlled machines and more particularly to the printing mechanism of such a machine in which alphabetic printing is desired.

The principal object of the invention is to provide an improved form of printing mechanism which may be called upon when occasion requires to print either numerals or alphabetic characters.

It is a further object of the invention to provide improved means whereby group selection and type selection occur during a single card feeding cycle and under control of a common card analyzing means.

In carrying out the invention, record cards bearing zone perforations and digit perforations are moved to pass a sensing station with the zone perforations leading and the digit perforations following in the order 0, 1, 2 . . . 7, 8, 9. The type bar, which rises during the sensing of the digit perforations, is provided with four stopping ledges for each digit, the stopping ledge to be engaged by a pawl being determined in accordance with the sensing of the zone perforations prior to the elevation of the type bar.

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

In the drawings:

Fig. 1 is a transverse sectional view through the printing mechanism illustrating a single embodiment of the invention.

Fig. 2 is an enlarged position view of the type bar positioning mechanism.

Fig. 3 is a detail of certain operating devices.

Fig. 4 is a representation of a regular Hollerith card, showing the combinational arrangement of the perforations to represent the various numerals, alphabetic characters, and symbols.

The arrangement of the perforations on the record card will first be explained. Referring to Fig. 4, the record card C has the usual perforations for indicating numerical values as shown at the left end of the card. The alphabetic characters from A to I are combinations of one of the numerical characters from 9 to 1 plus a perforation in the R index point position. The characters J to R each comprise a perforation in one of the numerical positions 9 to 1 plus a perforation in the X index point position. The remaining letters of the alphabet, namely S to Z, each comprises a combination including one of the perforations 9 to 2 plus a perforation in the 0 index point position. A further combination of 1 and 0 represents the symbol &.

The record cards are placed in the card feed

mechanism of the machine, which is not shown, but which may be of the type fully shown and described in Patent No. 1,827,259, granted to J. R. Peirce, October 13, 1931.

Fig. 1 shows the card analyzing elements of the feeding mechanism diagrammatically as representing the usual analyzing brushes LB past which the cards C are traversed in succession with the R index point positions leading so that the holes are sensed in the order R, X, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Rollers 10 convey the card to pass the brush LB which makes contact with a common contact roller 11 through the holes. Roller 11 is connected to the positive side of a suitable source of current through circuit breaker contacts 12 and card lever contacts CL which former close and open again as each position is at the sensing position and the latter are closed only while the card is passing the brushes.

Brush LB is connected by a suitable plug connection 13 to the center blade of pairs of contacts 14 and 15, controlled by a cam 16 so timed that contacts 14 are closed during the sensing of the positions R, X, and 0 and contacts 15 are closed at other times. Upon encountering a hole in any zone position R, X, or 0, a circuit is established from positive side of source of current through contacts CL, 12, roller 11, zone hole, brush LB, connection 13, contacts 14, wire 17, zone magnet 18, wire 19, to negative side of source.

Upon encountering a hole in any of the digit positions 1 to 9, a circuit is established from positive side of source through contacts CL, 12, roller 11, digit hole, brush LB, connection 13, contacts 15, wire 20, magnet 21 and wire 19, back to source. For each card column there is provided a brush LB, contacts 14, 15, and magnets 18 and 21, the latter being staggered for compactness.

In Fig. 2 is shown the type head 22 which is provided with a plurality of type elements 23 upon which the digits and alphabetic characters are arranged as indicated. The type head is arranged to be moved past the printing position opposite platen 24 in synchronism with the movement of the card C past the brushes LB so that as the 1 index point position is passing the brushes, the type elements I, &, J, and A pass through printing position; as the 2 index point position is passing the brushes, the type elements 2, S, K, B, pass through the printing position and so on.

Type head 22 is secured to the type bar 25 which is mounted for horizontal reciprocation and has link connection 26 at its lower end (Fig. 1) with an arm 27 pivoted at 28. Also pivoted at 28 is a bail 29 connected by a link 30 to an arm 31 secured to shaft 32. Between a cross bar on arm 31 and arm 27 is a spring 33. Shaft 32 carries an arm 34, linked to arm 35 on a shaft 36 which also carries cam follower arms 37 whose related complementary cams 38 are

secured to the main drive shaft 39 of the machine. As shaft 39 rotates, once for each card cycle, type bar 25 rises under the influence of spring 33 with a uniform motion to cause sets of ledges 40 to pass the toe 41 of stopping pawl 42 as the correspondingly numbered index point positions pass brush LB.

Pawl 42 is normally held in the position shown in Fig. 1 by a latch 43 which is connected by a link 44 with armature 45 of magnet 21. The pawl also carries a pin 46 lying in the plane of steps 47 at the upper end of a bar 48 which is mounted for oblique reciprocation. A spring 49 urges bar 49 downwardly under control of a bail 50. On the bar are three teeth 51 labelled R, X, and 0 and as the correspondingly labelled index point positions pass brush LB these teeth pass the end of stopping pawl 52. Bail 50 is secured to a shaft 53 on which is an arm 54 (Fig. 3) connected by a link 55 to a follower lever 56 cooperating with a cam 57 on shaft 39.

As bar 48 moves downwardly, positions R, X, and 0 are sensed in succession and a hole in any of these positions will energize magnet 18 as explained to attract its armature 58, drawing on a link 59 to rock latch 60 and release pawl 52 for engagement with the tooth 51 corresponding to the zone hole sensed. This will position the corresponding step 47 in the path of pin 46. As shown in Fig. 2, magnet 18 is tripped in response to a 0 zone hole, intercepting the 0 tooth 51 and placing the 0 step 47 in the path of pin 46.

After the three zone holes have been sensed, the type bar commences to rise and the circuits are shifted to place magnets 21 under control of the brushes LB. Sensing of a second hole in a digit position of a column will now release pawl 42 and it will swing into engagement with one of the ledges 40 related to the hole sensed. The particular ledge engaged will depend on the prior setting of bar 48. Thus, if bar 48 is set as in Fig. 2 and a 2 hole is subsequently sensed, pawl 42 is released and will engage the 0 ledge 40 in the 2 position.

If a column contains only a digit perforation, bar 48 will not be intercepted and will advance to the limit of its stroke which is one step lower than shown in Fig. 2. Consequently, when the digit hole is sensed, pawl 42 can swing its maximum amount and will engage the highest ledge of the related set, positioning the type bar with the element corresponding to the hole sensed at the printing line.

In Fig. 2, the parts are positioned to select the letter S in response to the sensing of a 0 hole and a 2 hole. If the zone hole had been X, pawl 42 would have intercepted the next lower ledge of the 2 set of ledges to select the letter K for printing, while if the zone hole had been R, pawl 42 would have intercepted the second lower ledge of the 2 set to select the letter B for printing.

After all the type bars are positioned, the usual printing hammers 61 are tripped and the bars are ready to descend to restored position and the pawls and latches are reset to normal position. Extending beneath an arm of pawl 42 is a bail 62 carried by a shaft 63. On the shaft is an arm 64 (Fig. 3) connected by a link 65 to a follower lever 66 cooperating with a cam 67 on shaft 39. Beneath latches 52 is a bail 68 on a shaft 69 which carries an arm 70 connected by a link 71 to a follower lever 72 cooperating with cam 73 on shaft 39. Shaft 69 also has an arm

74 with link connection 75 to an arm 76 on shaft 77 which supports the restoring ball 78 for the latches 60.

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

What is claimed is as follows:

1. In a printing machine, in combination, analyzing means for successively searching index point positions in a column of a record card, a type bar having a plurality of sets of stepped stopping ledges, means for moving said bar, a stopping element positionable into the path of said ledges, means controlled by said analyzing means for selectively moving said stopping element into the path of a selected one of said sets of ledges and further means controlled by said analyzing means for selecting one of said ledges in the selected set for engagement by the stopping element.

2. In a printing machine, in combination, a type bar, means for moving the same, said bar having a plurality of sets of staggered stopping ledges extending different distances from the bar, a stopping pawl movable to engage any of said sets of ledges and means for selectively positioning said stopping pawl to engage one of the ledges of the selected set of ledges.

3. In a printing machine, in combination, a type bar, means for moving the same, said bar having a plurality of like sets of staggered ledges, the ledges of each set extending different distances from the bar, a stopping pawl movable to engage one of said ledges, means for selecting a set of ledges for engagement by the pawl and further means for adjusting the position of the pawl to engage a selected ledge in said selected set.

4. In a printing machine, in combination, card analyzing means for reading a record card, a type bar, means for moving the same, said bar having a plurality of like sets of staggered stopping ledges, the ledges in any one set extending different distances from the bar, a stopping pawl movable to engage any of said ledges, magnetic means controlled by said analyzing means, and means controlled by said magnetic means for selectively positioning said stopping pawl to engage a selected one of said ledges in a selected set.

5. In a printing machine, in combination, card analyzing means for reading a record card, a type bar and means for moving the same, a plurality of parallel lines of stopping ledges carried by the bar, with the lines of ledges arranged parallel to the line of movement of the type bar and adjacent to each other, a positionable stop for said type bar, movable a number of different extents to intercept the several lines of ledges, under control of said analyzing means, and further means controlled by said analyzing means and operative in advance of the operation of said positionable stop for determining the extent of movement of the said positionable stop whereby the latter will engage a ledge in the selected line of ledges to stop the type bar.

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