

PUBLISHED

G. VIEILLARD

Serial No.

MAY 25, 1943.

RECORD CARD FOR CARD CONTROLLED MACHINES

321,161

BY A. P. C.

Filed Feb. 28, 1940

9 Sheets-Sheet J

Fig. 3

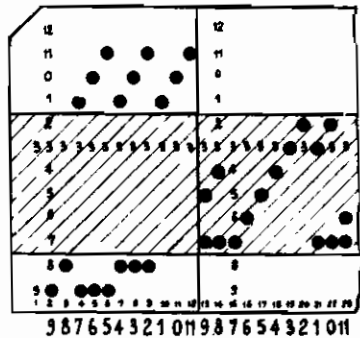


Fig. 4

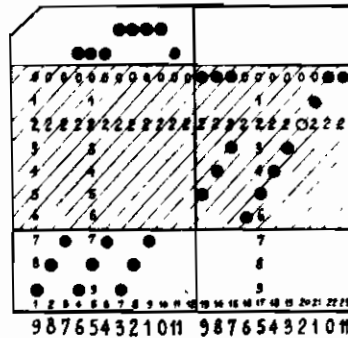


Fig. 1

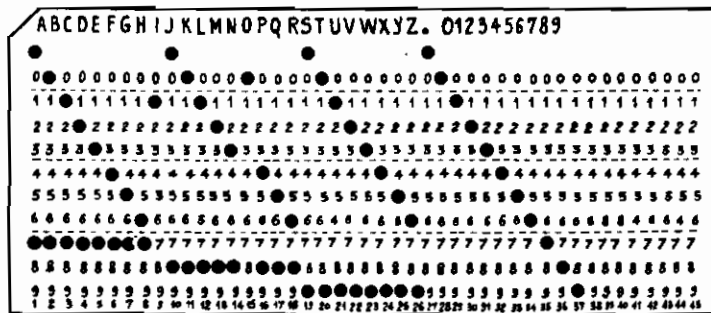
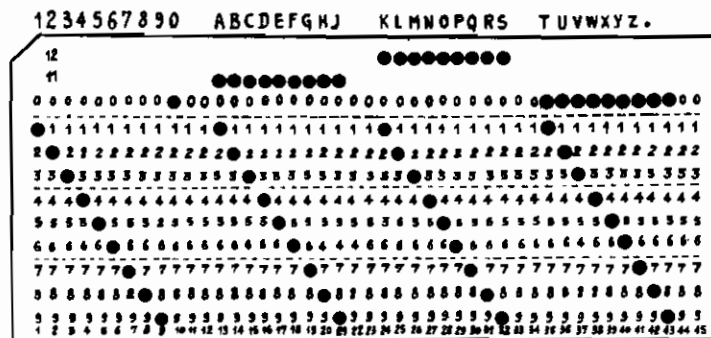


Fig. 2



INVENTOR:
 GEORGES VIEILLARD
 BY *Hastings, Lake & Co.*
 ATTORNEYS

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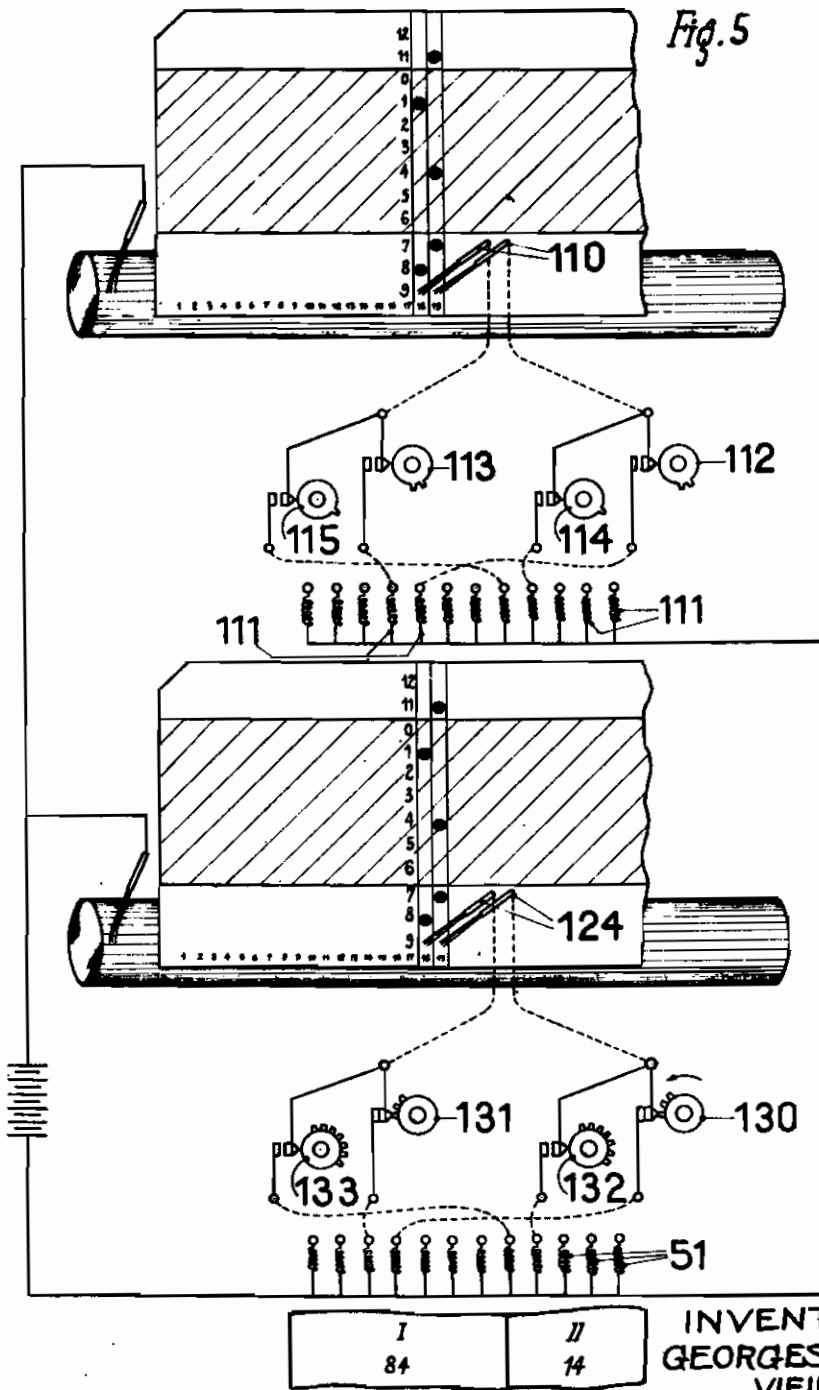


Fig. 5

INVENTOR:
 GEORGES
 VIEILLARD
 BY *Haseltine, Lake & Co.*
 ATTORNEYS

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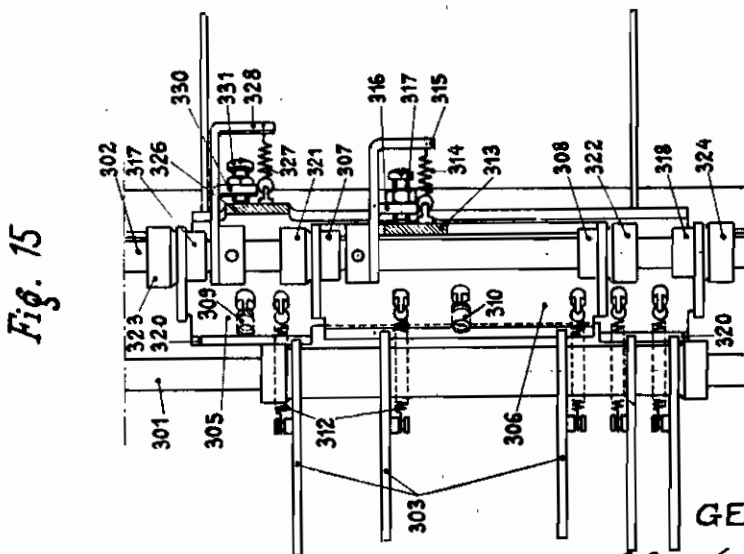
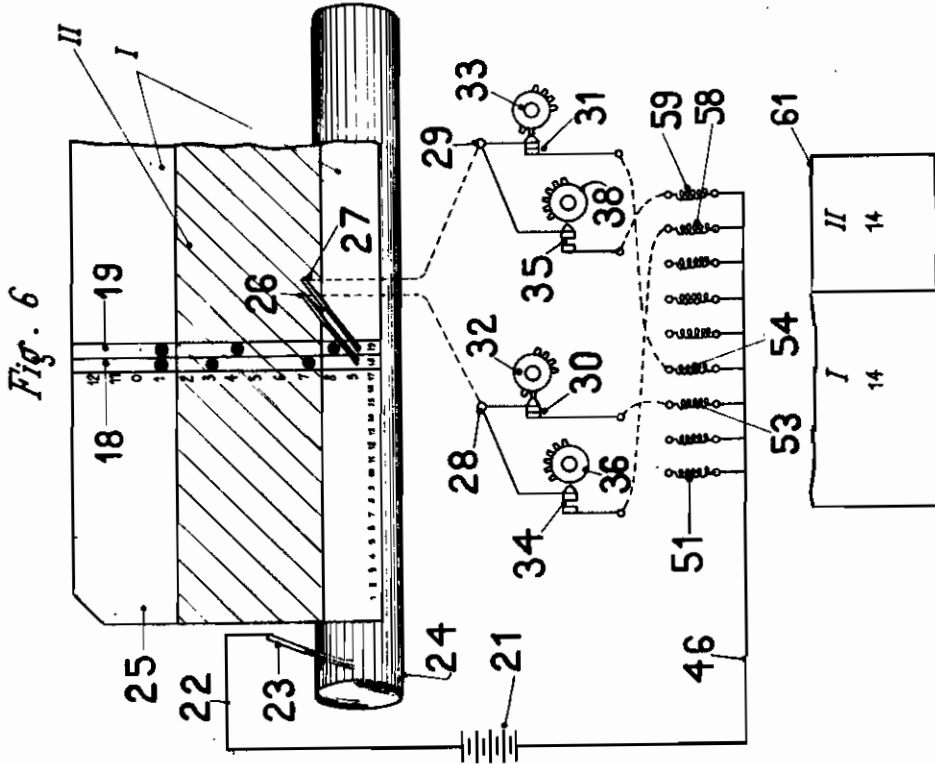
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INVENTOR:
 GEORGES
 VIEILLARD

BY *Haseltine, Lake & Co.* ATTORNEYS

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Fig. 7

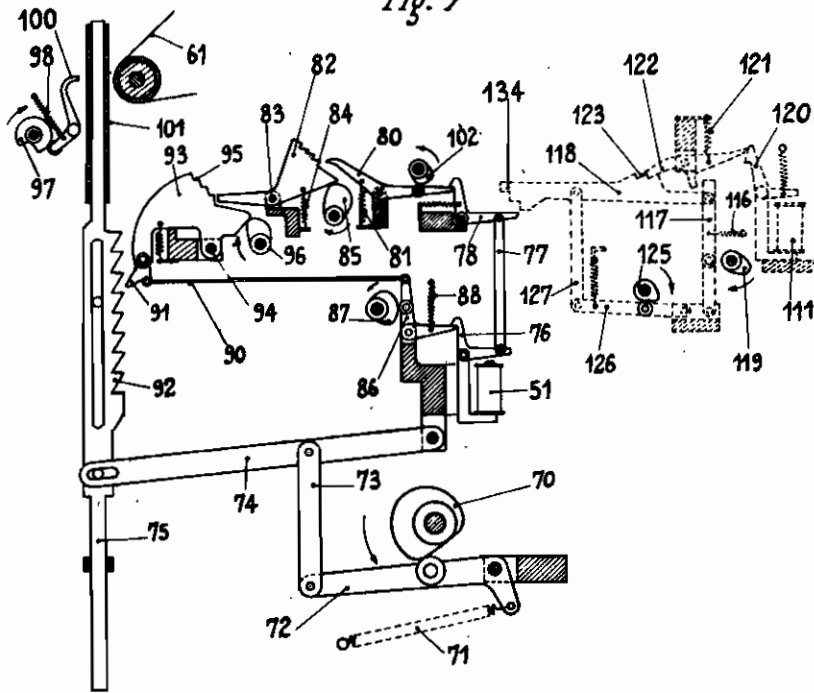
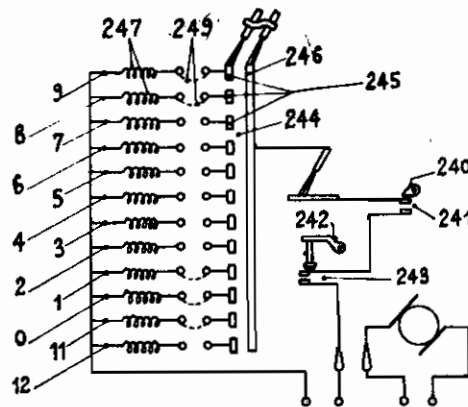


Fig. 12



INVENTOR:
GEORGES VIEILLARD
BY *Haseltine, Lake & Co.*
ATTORNEYS

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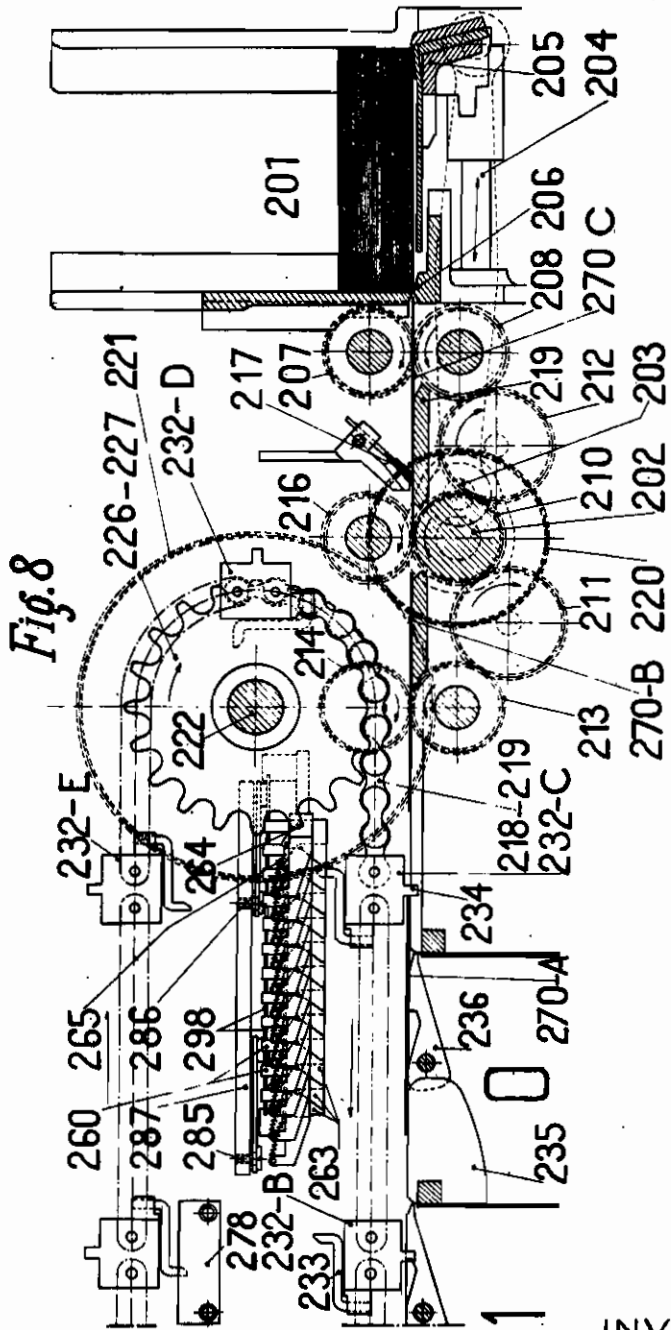


Fig. 8

INVENTOR:
GEORGES VIEILLARD
BY *Haseltine, Lake & Co.*
ATTORNEYS

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G. VIEILLARD

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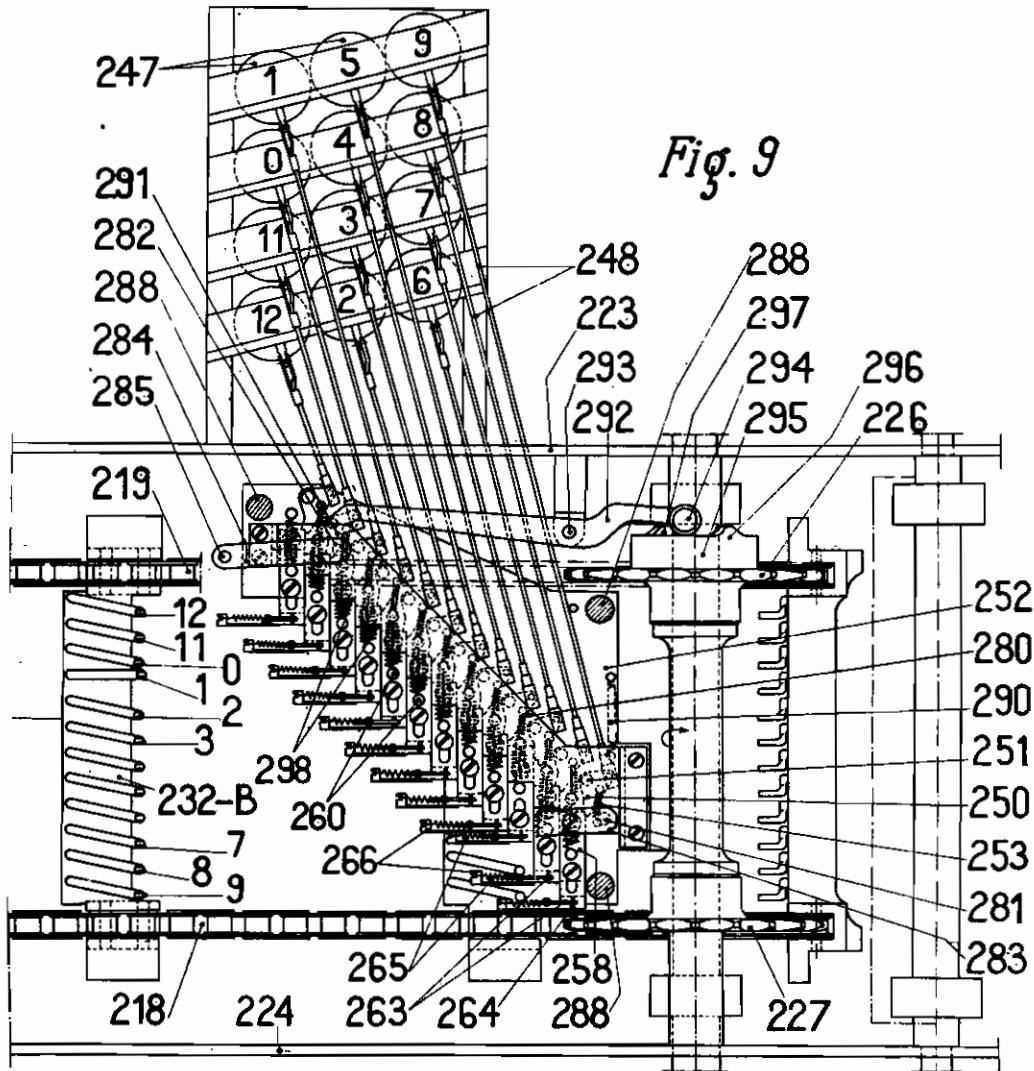
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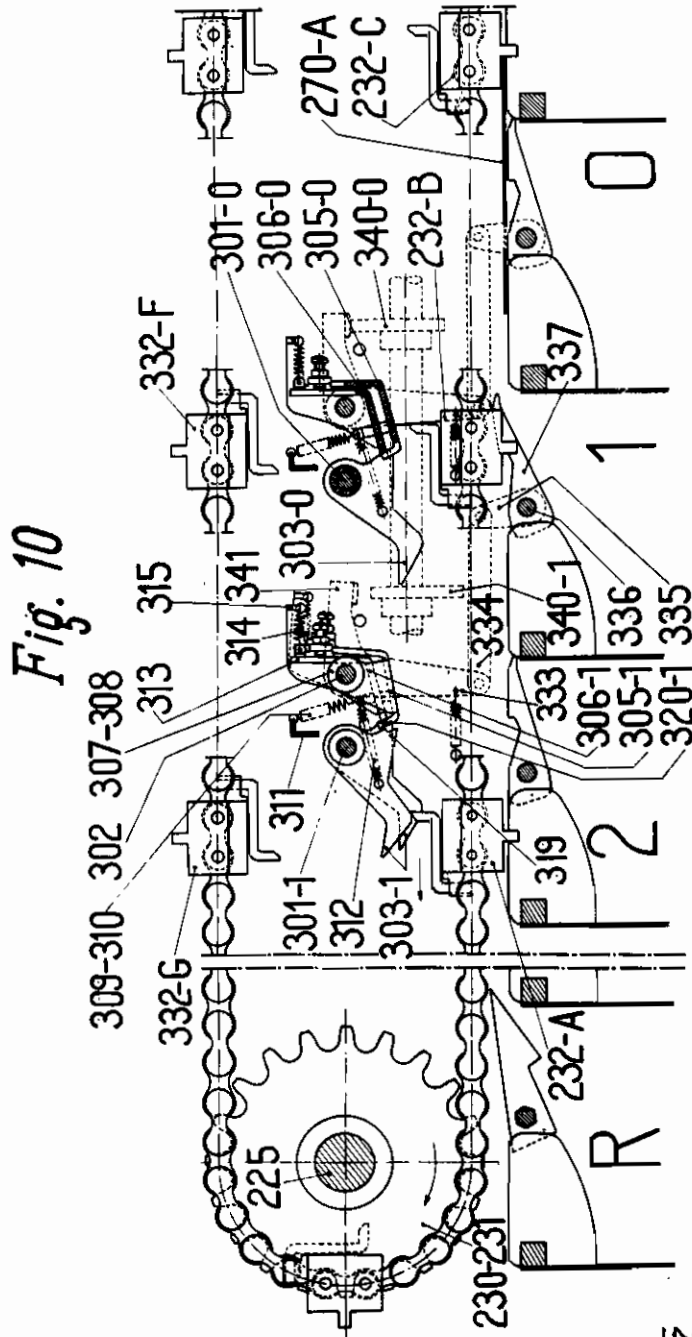


INVENTOR:
GEORGES VIEILLARD
BY *Haseltine, Lake & Co*
ATTORNEYS

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INVENTOR:
GEORGES VIEILLARD
BY *Haseltine Lake & Co.*
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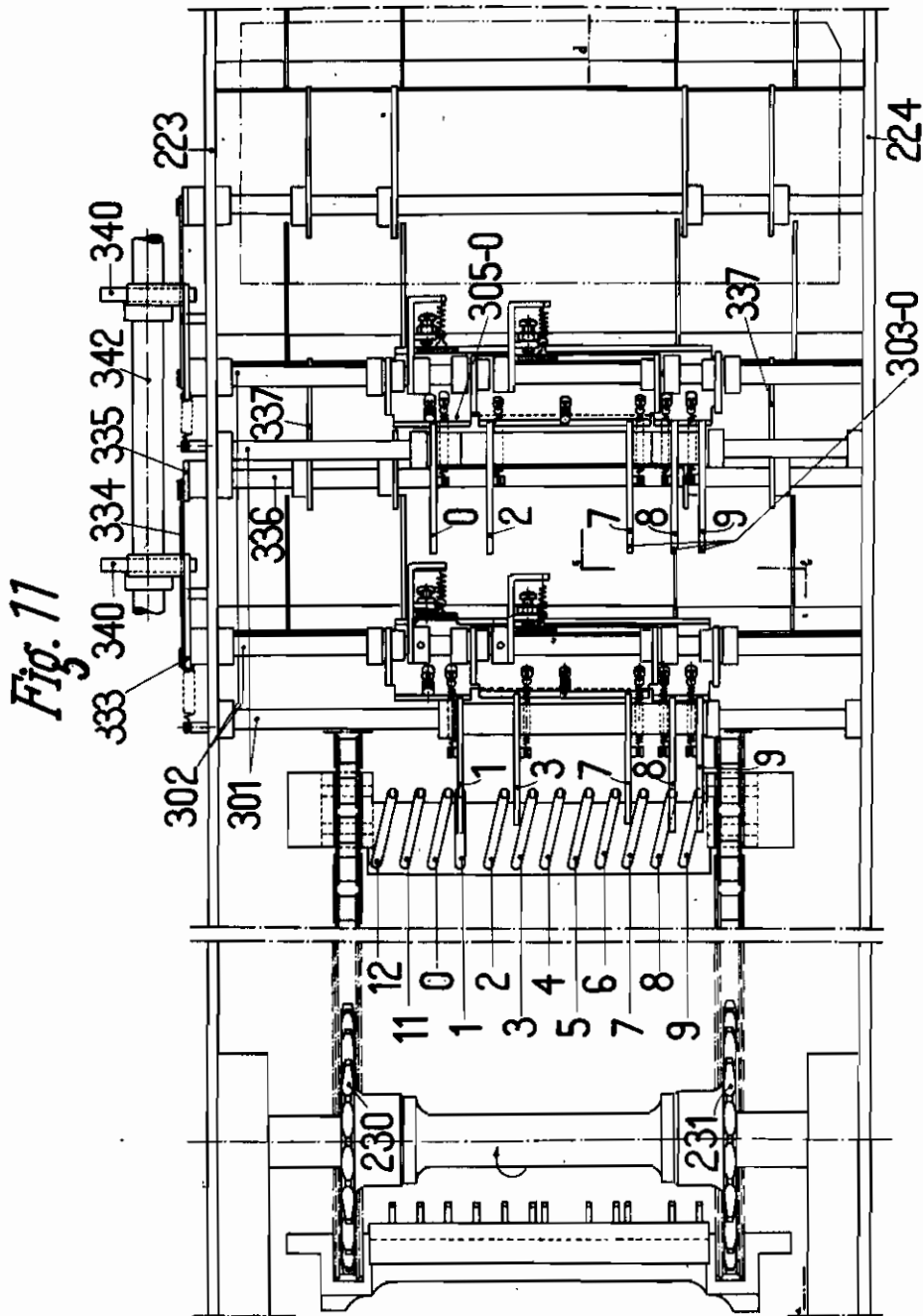


Fig. 11

INVENTOR:
GEORGES VIEILLARD
BY *Haseltine, Lake & Co.*
ATTORNEYS

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Fig. 13

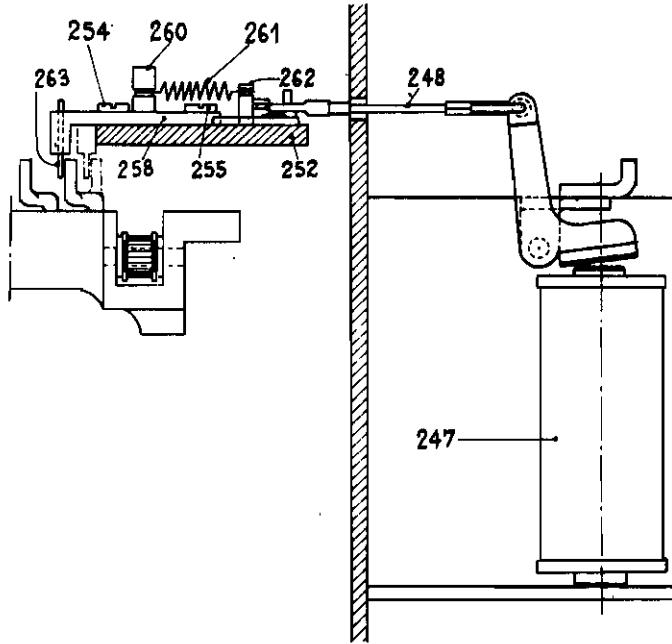
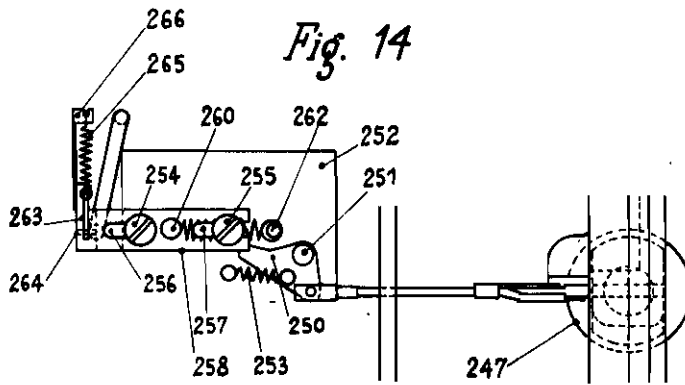


Fig. 14



INVENTOR:
GEORGES VIEILLARD
BY *Haseltine, Lake & Co.*
ATTORNEYS

ALIEN PROPERTY CUSTODIAN

RECORD CARD FOR CARD CONTROLLED MACHINES

Georges Vieillard, Paris, France; vested in the Alien Property Custodian

Application filed February 28, 1940

The present invention refers to a record card for card controlled machines and especially to a record card in combination with an electrically operated printing tabulator or a sorter.

The card according to the present invention, may comprise printed or written records, and the analysis of the card may be effected by photo-electrical devices which emit electric impulses timed in correspondence with the records which are analyzed.

The following description refers to a preferred embodiment of the invention and concerns a perforated record card which is analyzed by a well-known device comprising a series of brushes which in making contact through the perforations of the card establish the electric impulses in timed relation to the location of said perforations in the card.

A perforated card of known type is shown in Fig. 1. It comprises a number of vertical columns each of which contains ten index point positions representing the values from 0 to 9 and two additional index positions for control purposes. Index points of the same value are located on a horizontal line.

In order to indicate in a single vertical column any alphabetical letter without increasing the number of index point positions, it is known to represent a letter by two combined index point positions. In Fig. 1 is shown a card with a known code for this purpose. Said card may be analyzed in a known tabulating machine by one single row of contact brushes during the movement of said card; the printing device of said tabulating machine may comprise one single magnet for each interpreted column of the card and the complete analyzing and printing of an alphabetical card indication may be effected during one single cycle of the tabulator.

Another manner of interpreting a card with combined index point indications is to use two different analyzing devices, one device analyzing the upper and the second device analyzing the lower of two indications forming together a combined letter indication. In Fig. 2 is shown a card with a normal alphabetical code adapted for such machines. The analysis and interpretation of such a card is generally effected during two cycles of the tabulating machine.

The upper indications 0, 11 and 12 are analyzed when the card passes a first analyzing device and the indications 9 to 1 are analyzed when the card passes a second analyzing device.

For the purpose of obtaining an increased number of vertical columns in a card of deter-

mined size, it is known to divide a card in two horizontal portions, each portion provided with a number of vertical columns which comprise each a certain number of index point positions for the indication of any value from 0 to 9. In case the number of index point positions in a vertical line of the complete card is not increased, some of the values from 0 to 9 in each portion must be indicated by combined indications.

In order to interpret such last mentioned cards, it has been hitherto necessary to change the construction of the ordinary above-named printing devices, or to use additional devices which transform the two electric impulses indicating in combination one single cipher, into one single impulse, timed to correspond to said cipher which should be printed.

Further it was necessary that a complete cycle of the printing device should correspond to an horizontal portion of the card, that is two cycles of the printing device were necessary to interpret a card divided in two horizontal portions. A printing device adapted to interpret such cards could not be used to interpret normal cards without important modifications.

An object of the present invention is a record card comprising one single set of horizontal lines of index point positions of the value from 1 to 9, which card is divided in two or more horizontal portions representing, by single or combined index point positions in each vertical column of each portion all values from 1 to 9, said portions being so arranged that both portions may be interpreted by one single passage of the card in the tabulating machine and by a printing device adapted to interpret the combined alphabetical indications of a card comprising one single set of values from 1 to 9 in each vertical column of the card.

Other objects of the present invention will be hereinafter set forth in the accompanying specification and claims and shown in the drawings, which by way of illustration show what I now consider to be the preferred embodiments of the invention.

In the drawings:

Fig. 1 shows a perforated card of normal type with alphabetical code, which card may be interpreted by a printing device with a single magnet for each interpreted card column, as shown Fig. 7 in full lines.

Fig. 2 shows a card with another alphabetical code. The interpretation of this card requires a printing device provided with two magnets for each interpreted card column, as shown in Fig. 7

dotted lines included. The operation of said two magnets is generally performed during two cycles of the machine.

Fig. 3 shows a card according to the invention divided in two horizontal parts, each part containing a certain number of index point positions to represent the values from 9 to 0 said values being partly represented by single index point positions and partly by combined index point positions arranged and adapted according to the invention to be read and printed by a normal printing device controlled by a single magnet for each printed character.

Fig. 4 shows a card according to the invention, adapted to be read and printed by a normal printing device controlled by two magnets for each interpreted card column.

Fig. 5 shows the connections between the printing device and the card shown in Fig. 4.

Fig. 6 shows the connections between the printing device and the card shown in Fig. 3.

Fig. 7 shows schematically a printing device adapted to interpret the cards shown in Figs. 1, 2, 3 and 4.

Fig. 8 is a longitudinal section of the right side of the sorting machine.

Fig. 9 is a plan view of the part shown in Fig. 8.

Fig. 10 is a longitudinal section of the sorting machine at the left hand side of the section shown in Fig. 8.

Fig. 11 is a plan view of the part shown in Fig. 10.

Fig. 12 is a wiring diagram of the sorting machine.

Figs. 13 and 14 show details of Figs. 8 and 9.

Fig. 15 shows details of Fig. 11.

According to the invention, the card shown in Fig. 3 is divided in two horizontal parts. The first part comprises the horizontal lines for the index point positions 9, 8, 1, 0, 11 and 12, and the second part the horizontal lines for the index point positions 7, 6, 5, 4, 3 and 2. Each column of each horizontal part may indicate any or all values from 0 to 9 according to the following codes:

Value	System I indication	System II indication
9.....	9	7 and 5
8.....	8	7 and 4
7.....	9 and 1	7
6.....	9 and 0	6
5.....	9 and 11	5
4.....	8 and 1	4
3.....	8 and 0	3
2.....	8 and 11	2
1.....	1	7 and 3
0.....	0	7 and 2
11.....	11	7 and 6

Fig. 6 represents how the columns of the card shown in Fig. 3 are connected to the printing device. From the current source 21, a line 22 leads to the brush 23 which makes contact with the contact roller 24. The reading of the two card columns 18 and 19 is effected by two brushes 28 and 27 connected to the plugs 28 and 29. From the plug 28, a line passing by the contact 30 leads to the printing magnet 53 and another line passing by the contact 34 leads to the magnet 58. From the plug 29, a line passing by the contact 31 leads to the magnet 54 and another line passing by the contact 35 leads to the magnet 59. The cams 32 and 33 close the contacts 30, 31 respectively when the indications of the card belonging to the system I pass the brushes, that is during the passage of the indications 9, 8,

1, 0 and 11 in front of the brushes, and the cams 38 and 38 respectively close the contacts 34 and 35 when the indications belonging to the system II, that is the indications 7, 6, 5, 4, 3 and 2 pass the brushes. In the example shown Fig. 6, the column 19 contains the perforations 8 and 1, in the part belonging to the system I, and the perforation 4 in the part belonging to the system II. Magnet 54 receives therefore the impulses 8 and 1 and magnet 59 receives a simple impulse 4. According to the code mentioned above, the figure 4 will be printed in both systems indicated by column 19. The figure 1 is indicated in both systems of the column 18, which indications cause an impulse 1 for magnet 53 and impulses 7 and 3 for magnet 58. Evidently the figure 14 for instance may be indicated by the two parts of the same column of the card.

Fig. 7 shows schematically a normal printing machine. All the cam shafts indicated are in gear connection with each other and make one revolution for every cycle of the machine and for every card that is analyzed. Said shafts are rotated by a motor by means of a gear train (not shown). The cam 70 permits the spring 71 by means of levers 72, 73 and 74 to impose an upward movement to the type rack 75 in synchronism with the passage of the card in front of reading brushes Fig. 6. Magnet 51 is energized a first time by a circuit established by one of the perforations 9, 8 or 7 of the card. The armature 76 by means of the rod 77 and lever 78 releases pawl 88 which is moved by the spring 81 and blocks sector 82 in one of three positions which correspond each to one of said perforations 9, 8 or 7. Sector 82 pivots about its fixed pivot 83 moved in clockwise direction by spring 84, cooperating with cam 85 and in synchronism with the passage of the perforations 9, 8 and 7 in front of the brushes Fig. 6. If there are no perforations 9, 8 or 7, sector 82 Fig. 7 will be stopped in the fourth position by the concentric part of the circumference of cam 85. During the passage of the perforations 9, 8 and 7 in front of the brushes Fig. 6, lever 86 Fig. 7 is blocked by the cam 87 so that the energization of magnet 51 during this period has no effect upon lever 86. Just before the perforation 6 passes the brushes, cam 87 ceases to block lever 86 which remains free from cam 87 during the period when the other perforations of the card pass in front of the brushes. When one of said perforations energizes the magnet again, the armature 76 is actuated, spring 88 rocks lever 88 and by means of the rod 90, pawl 91 which meshes with a tooth 92 of the type rack 75.

Pawl 91 pivots on sector 93 which, because of the upward movement of the rack 75 will swing in clockwise direction about its fixed pivot 94, until one of its steps 95 hits the left extremity of sector 82. For each of its teeth 92 which corresponds each to a perforation in one of the index point positions from 6 to 0 on the card, the rack 75 may therefore be stopped in one of the four positions according to the presence of a perforation in one of the index point positions 9 to 7 of the card, or to the absence of such perforation. When all the index point positions of the card have passed in front of the brushes Fig. 6, cam 97 Fig. 7 permits spring 98 to strike the hammer 100 against that one of the types 101 which is in printing position, whereby said type will be printed on the paper 81.

After the printing operation, the different cams 102, 85, 86, 97 and 70 restore lever 80, sector 82

and 83, lever 86 and rack 75 respectively, to their initial positions. The printing device described is adapted to print the values indicated by the perforations of a card according to Fig. 3; the magnets of the printing device are connected as shown in Fig. 6. When the indications are located as shown in Figs. 1 and 3, one single magnet 51 is necessary for each system for printing the indications of each column of the card.

When the indications are located as shown in Figs. 2 and 4, an additional magnet is used for each column of the card, and the connections between the card and the printing device may be effected as shown in Fig. 5. In this case, the printing device does not include the rod 77, Fig. 7, but is provided with the additional parts represented with dotted lines. The printing of the values of two columns of a card according to the Figs. 5, 2 or 4 will now be explained by means of Figs. 5 and 7. In this case, the tabulating machine is provided with two card reading stations, so that the card will first be read by the brushes 110 and one cycle later by the brushes 124. When the card passes in front of the upper brushes 110, Fig. 5, the magnets 111 of both systems will be energized by the indications 0, 11 or 12. The indications 11 and 12 belong to the system I and their corresponding cams 112 and 113 establish the circuits for the magnets 111 placed on the left, whereas the indications 0 belonging to the system II and their corresponding cams 114 and 115 establish the circuits for the magnets 111 placed on the right. Cam 119 Fig. 7 permits the spring 116 to move lever 117 and thus the rack 118 towards the right in synchronism with the passage of said indications 0, 11 and 12 of the card. When the magnet 111 is energized by a circuit established by one of the indications 0, 11 or 12, the armature 120 is actuated so that spring 121 may rock pawl 122 which engages with one of the teeth 123 of the rack 118 and blocks said rack. Later on, before the card passes in front of the lower brushes 124 Fig. 5, cam 85 Fig. 7 permits spring 84 to rock sector 82 in clockwise direction, as previously described. Simultaneously cam 125 rocks levers 126 and 127 and thereby rack 118 downwards, so that the left extremity of rack 118 rocks lever 78 clockwise, thereby releasing lever 80 for the stopping of sector 82 as described. The left extremity of rack 118 is provided with steps 134, so that said rack may touch lever 78 at a moment depending of the position of rack 118 in relation to lever 122, that is at a moment depending on which tooth 123 is engaged with lever 122, that is finally depending on which of the indications 0, 11 or 12 has energized magnet 111. When the card arrives in front of the lower brushes 124, the selector 82 is thus positioned as described, and when magnet 51 is energized by the indications 9, 8 or 7 (for system I) and by one of the indications from 6 to 1 (for system II), the printing will be effected as previously described. The circuits for the magnets 51 are established by the indications of the card cooperating with the cam contacts 130 and 131 for the system I, and with the cam contacts 132, 133 for the system II, Fig. 5. The cams 130, 131 close their corresponding contacts when the indications 9, 8 and 7 pass the brushes 123, and the cams 132, 133 close their corresponding contacts when the indications 6, 5, 4, 3, 2 and 1 pass the brushes 124. The section of the printing machine shown in Fig. 7 is thus adapted to print the indications according to

any of the two systems I or II. The printing of the characters 84 (system I) and 14 (system II) shown in Fig. 5 or 6 requires naturally 4 such sections or columns of the printing machine as indicated Fig. 7.

A sorting machine adapted to sort the cards according to the invention, will now be described. Several elements and details have been omitted in the figures of the sorting machine, in order to show more clearly the working of the machine.

The cards are introduced in the magazine 201 Fig. 8. On the main shaft 202 is fastened a pulley (not shown), which is driven in counterclockwise direction by a belt when a motor (not shown) is set into operation. To each extremity of shaft 202 and eccentric in relation to the center line of the shaft is fastened a pivot 203, on which pivots a connecting rod 204, connected to the picker 205. For every revolution of shaft 202, the picker 205 pushes a card through the slot 206, and between the two rollers 207, 208. To shaft 202 is fastened a toothed wheel 210 which by means of two intermediate wheels 211, 212 turns the feeding rollers 213 and 214 in counterclockwise direction. To each of said feeding rollers correspond the press rollers 214 and 217. Shaft 202 constitutes on a part of its length a feeding roller against which the press roller 216 presses. The rollers feed the card under the brush 217 and then under the chains 218—219. To shaft 202 is further fastened a toothed wheel 220 meshing with wheel 221 fastened to shaft 222, so that this latter executes half a revolution for every revolution of shaft 202. Shafts 202, 222 and rollers 208 and 213 may rotate in bearings fixed to the two side-plates 223, 224 extending all along the machine and supporting all the card receiving pockets and shaft 225 Figs. 10 and 11. To shaft 222 are fastened two chain supporting wheels 226, 227, and to shaft 225 the two wheels 230, 231. The two endless chains 218 and 219 are connected together by cross-beams 232 A—B—C, etc., each supporting 12 fingers 233, each finger may take two different positions, an operative and an inoperative position (Fig. 9). The chains are moved clockwise about shaft 222, and the cross-beams 232 are so spaced that when a card leaves the last rollers 213, 214 a cross beam is just placed behind the card. The projection 234 of the cross beam pushes then the card towards the left, guided by the guide 235 and the flaps 236 of the receiving pockets. From right to left there are 12 pockets from 0 to 9, 11 and 12 and a pocket R, Fig. 10. The brushes 217 may be displaced sideways to correspond to the column of the card according to which it is desired to effect the sorting. When a card passes under the brush, it will contact through the perforations and establish a circuit for every perforation in the column in question. In the scheme Fig. 12, a cam 240 fastened to main shaft 202 closes the contact 241 during the time when the card is under the brush, but opens the circuit when the brush is in the interval between two cards. A lever 242 closes card contact 243 when a card passes under the brush and opens the contact when there are no more cards. A commutator 244 comprises two brushes fastened to the main shaft 202. The brushes are electrically connected but insulated from the shaft. For every revolution of the main shaft, the brushes connect successively the 12 segments 245 with the common wire, according to the passage of

the index points of a column of the card under the brushes.

Each segment is electrically connected by means of a connecting plug 249 to one of the twelve sorting magnets, each magnet corresponding to a value or a perforation of the card from 0 to 9 and 11 to 12.

In the scheme Fig. 12, only the magnets belonging to system I of the card are connected. The magnets control the selection of the fingers on the crossbeams of the chain in the following way: the armature of each magnet 247 Figs. 9, 13 and 14 is connected by a connecting rod 248 to the pawl 250 pivoting on the fixed pivot 251 fastened on plate 252. The pawl is held in locking position by spring 253 fastened to plate 252. For each magnet are fixed to the plate 252 two screws 254, 255 provided with a threadless shoulder placed in the slots 256, 257 of a selector 258 so that this latter may move in a direction perpendicular to the movement of the cross-beams. To the selector 258 is fastened a pin 260 which constitute a stop for said movement. The spring 261 pulls the selector against the pawl 250. Spring 261 is at one end fastened to said pin 260 and at the other end to a pin 262 fixed to the plate 252. To the left end, in a vertical groove, the selector is provided with a winglet 263 which may pivot on a horizontal pivot 264. The winglet is held in the position shown in Fig. 8 by means of a spring 265 which at the other end is fastened to a plate 266 fastened to the selector 258. During the normal operation of the machine, the winglet never turns about its pivot 264 but would perform said movement to avoid the damage of the fingers 233 in case of accidental jamming of said winglet against said fingers. There is a selector and a winglet for every indication of a vertical column of the card. The selectors with their winglets are situated on the plate 252 in such a way that when the perforation 9 of the card is under the brush, the finger 233 indicated with 9 Fig. 9 is adjacent the first winglet (from the right hand side). When a perforation 8 is under the brush, the finger indicated with 8 is adjacent to the second winglet. The drawing illustrated Fig. 8 shows a perforation 7 of the card under the brush 217 and the finger 233 indicated with 7 adjacent to the third winglet. One single of the twelve fingers 233 is thus situated adjacent to a corresponding winglet for each perforation of the card passing under the brush. If there is a perforation 7 in the card which is under the brush 217 Fig. 9, magnet 7 is energized according to the scheme shown Fig. 12, the corresponding pawl is rocked, and the corresponding selector is released. Said selector which is the third from the right hand side is displaced as shown in Fig. 9 by its spring 261. During said displacement, the winglet pushes the finger corresponding to the perforation 7 which is just adjacent to said winglet in its operative position. For each perforation of the card which energizes a magnet, a finger 233 will thus be set in operative position.

Fig. 8 shows a card 270c under the brush which will control the positioning of the fingers on the cross beam 232c, which at this moment is under the selectors. The card 270B provided with a perforation 1 has already set in position the finger 1 on the cross beam 232B. Card 270A Figs. 8, 10 and 11 has set in position the fingers on the cross beam 232A. The card is thus pushed along the path by a cross beam which is the sec-

ond following the cross beam on which the fingers have been positioned by said card.

When a cross beam has moved along the path and opened the pocket corresponding to the position of its fingers, it turns around the chain-wheels 230, 231 Fig. 10 and comes back towards the right hand side. The cross beam passes a row of fixed winglets 278 Fig. 8, which reset the fingers to their inactive positions. The selectors are reset to their initial positions once for each card, by means of a bar 280 which is pivotally connected on each end, 281 and 282 Fig. 9 to two levers 283, 284. To their left extremities, said levers pivot on two pivots 285, 288 Fig. 8 fastened to the horizontal support 287. Said support is fixed between the two side plates 223, 224. Plate 252 which carries the selector is fastened to support 287 by means of three shouldered pins 288, Fig. 9. Bar 280 is held in its inactive position by a spring 290 which holds the bar with one extremity 291 against the left extremity of lever 292. This latter pivots on the fixed vertical pivot 263 and carries on its right extremity a roller 294 which engages with the cam 295. Said cam is provided with two projections 296, 297 which rock lever 292 horizontally for every half revolution of shaft 222, that is for every cycle of the sorting machine, so that bar 280 is moved transversely in relation to the movement of the card, and pushes back all the selectors to their initial positions; in said position the selectors will be locked by the pawls 250. To this effect, the front edge 298 of the bar 280 has a toothed shape and cooperates with the pins 260.

Above each pocket, slightly on the left Fig. 10 there is a fixed axle 301—0, 301—1 etc., and an axle 302—0, 302—1 indicated by 302 on the drawings, said axle may rotate in bearings fixed to the side plates 223, 224. On the former axle, a certain number of locks 303 indicated by 303—1, 303—2 etc., on the drawings may pivot freely. These locks however cannot be displaced laterally.

In the description and in the figures, the numbers of the pieces which are repeated for each pocket are often followed by a number to indicate the pocket to which the piece belongs. Therefore the number 301—1 indicates the axle 301 for the pocket 1. Each lock 303 is arranged to cooperate and to be rocked by a determined finger when said finger is in its operative position. To enable the fingers to open a determined pocket, it is necessary that said fingers rock at the same time all the locks belonging to the code system according to which the sorting is effected.

On each of the axles 302 pivot freely two bails 305, 306, Figs. 10, 11 and 15. Bail 306 carries to each lateral extremity a boss 307—308 through which the axle 302 is passing. To bail 306 is fastened a spring 310 which to the other end is fastened to a plate 311 fixed to the frame. Said spring tries to rock the bail in counterclockwise direction, but said rocking movement is prevented by the noses 319 of those of the locks having the indications from 7 to 2. The locks themselves are held in their locking position by springs 312. The bail carries further a wing 313 to which is fastened a spring 314 which at the other extremity is fastened to the arm 315 fixed to the axle 302. Arm 315 is provided with a curvature 316 supporting a blocking screw 317 against which the wing 313 impacts when said wing takes a determined position. The other

ball 305 carries to each of its lateral extremities a boss 317, 318, through which the axle is passing. Ball 305 is placed below the bail 306, Fig. 10 and extends beyond each extremity of the bail 306, but the bails do not touch each other, even when they are rocking. To the bail 305 is fastened a spring 309 which, at the other end is fastened to the plate 311. Spring 309 tends to rock bail 305 in clockwise direction, but said rocking movement is prevented by one or a plurality of locks corresponding each to one of the fingers numbered 9, 8, 1, 0 and 11. The left edge 320 of bail 305 is provided with a notch on the part which extends below the bail 306 so that the bail 305 can never engage with the locks corresponding to the values from 7 to 2, but only cooperate with the locks which correspond to one of the values 9, 8, 1, 0 and 11. The two adjusting rings 321 and 322 fastened to the axle 302 insure the lateral position of the ball 305. Said ball 305 carries a wing 326 provided with a spring 327 fastened at the other end to arm 328 fastened to shaft 302. Arm 328 has a curvature 330 provided with an adjusting screw 331 which presses against wing 326.

To shaft 302 is fastened a lever 333 Fig. 10 which is pivotally connected to a rod 334 which at the other end is pivotally connected to the arm 335. Said arm is fastened to the axle 336 which may pivot in bearings fixed on the side plates 223, 224. The arms 337 are fastened to the axle 336 and constitute the flap for the pocket. All the other pockets comprise the same mechanism as above described. The locks which vary in quantity and position according to the code, constitute the only difference between the different pockets. The mechanical device is however the same for the sorting according to the two code systems or for the sorting of normal card with single perforations. The plug connection 249 Fig. 12 may change for the different systems.

Assume now that the sorting is effected according to system I, and that connections 249 are made for the figures 8, 9, 10, and 11. The card 270A is shown in Fig. 8 in the position it will take later on. It is provided with a perforation 1 which causes the energization of magnet 1 when the perforation 1 of the card passes under the brush 217, Fig. 8. At this moment the finger 1 of the cross-beam 232 is placed below the selectors, adjacent to that one of the winglets 263 which represents the value 1. When selector 1 is moved by its spring 253 as a result of the energization of magnet 1 (247), the finger 233 numbered 1 on the cross beam 232 A will be thus pushed by the corresponding winglet 263 in its operative position Figs. 8, 10 and 9. The cross beam 232A moves to the left and reaches first the lock for the first pocket which is the pocket 0 indicated on the right in the Figs. 10 and 11. Bail 305-9 belonging to the mechanism of said pocket 0, is locked by a lock 0 which may be rocked by a finger 0 in active position, by a lock 9 which may be rocked by a finger 9 in inactive position, and by a lock 8 which may be rocked by a finger 8 in inactive position. For the presumed case, the fingers 9 and 8 which are in their inactive position rock therefore the locks 9 and 8 but the bail 305-0 is continuously locked by the lock 0, which will not be rocked because finger 0 is in its inactive position and passes adjacent to the lock 0. Therefore the bail 305-0 will not rock. Bail 306 is locked by the two locks 7 and 2 which are positioned to

be rocked in their active position, by the fingers 7 and 2 respectively. As both these fingers are in their inactive position, they pass adjacent to the locks and bail 305-0 remains motionless. Therefore pocket 0 is not opened. The cross beam continues to advance and reaches the locks of pocket 1; said position is illustrated in the Figures 10 and 11. Bail 305-1 belonging to said pocket is locked by the two locks 9 and 8 which are in position to be rocked by the fingers 9 and 8 in inoperative position, and by the lock 1 positioned to be rocked in operative position by finger 1. As fingers 9 and 8 are in their inactive position, they will rock the two locks 9 and 8. At this same moment, fingers 1 in operative position will rock the lock 1. The bail 305-1 is therefore entirely unlocked and spring 309 will rock the bail 305-1 in clockwise direction as shown in Figs. 10 and 11. The two locks belonging to the system 2 which lock the bail 306 will not be rocked. Figs. 10 and 11 show fingers 7 to 2 in their inactive position passing adjacent to said locks. By the unlocking of bail 305, its wing 326 presses against the screw 331 and rocks the arm 328 Figs. 15, 10 and 11 and thus axle 302 in counterclockwise direction. Lever 333 fastened to axle 302 rocks therefore lever 335 and turns axle 336 by means of the rod 334, so that the flap 337 of the pocket 1, opens as illustrated in Fig. 10. The card 270A which has caused the selection of the fingers on the cross beam 232A, is placed at this moment exactly in front of the pocket 1, and will be pushed into the pocket by the cross beam 232C. After the pocket has remained opened during nearly a cycle of the machine, and after the card is entirely introduced in the pocket, said pocket will be closed by cam 340 cooperating with an arm 341 of lever 333 which rocks this latter and turns the axle 302 in counterclockwise direction, so that the bail 305 resume its initial position locked by the locks 1, 3 and 9. Simultaneously, the flap 337 will be restored to its initial position as indicated for the pocket 0, Fig. 10. Cam 340 is fastened to a shaft 342 which extends along the machine, making one revolution for each cycle, driven by shaft 222 by means of a bevel-gear (not shown).

Assume that the sorting is effected according to the second system, and according to a column with the perforations 7 and 3 indicating the value 1. The card should thus be sorted into the same pocket 1. The connections 249 shown in Fig. 12 are withdrawn and the magnets 7 to 2 are connected. When the card which is supposed to be the card 270A passes the brush 217, magnets 3 and 7 will be energized by the circuits established by the perforations 3 and 7; the fingers 3 and 7 will be set in working position, on the cross beam 232 which, at this moment is placed below the selectors 258. When the cross-beam 232A later on passes below the locks 320 of the pocket 0, the lock 7 will be rocked, but not the lock 2, because this latter is placed on the path of a finger 2 set in working position, whereas finger 2 is placed in inoperative position. The bail 306-0 therefore will not rock. The bail 305-0 will not rock either, because the lock 0 is placed in the path of a finger 0 in operative position while said finger is in its inoperative position.

When the cross-beam arrives below the locks of pocket 1, locks 3 and 7 are rocked by the fingers 3 and 7 in operative position, bail 306-1

rocks; pocket 1 is opened as described, and the card will be introduced into the pocket.

In case the sorting is effected for normal cards with a single perforation in the column in question, all the magnets will be connected by the connections 249, Fig. 12. It is evident that for two cards having respectively the perforations 0 and 1, the conditions will be exactly the same as above described, and the pockets 0 and 1 will be opened. For example, if the sorting takes place according to the system 1 or according to the normal system, and if the perforation 0 appears on the card, fingers 8 and 9 will be in inoperative position and finger 0 in operative position. Said fingers will be placed therefore in the path of the locks 9, 8 and 0 of the pocket 0 Fig. 11, bail 305 will rock and the pocket will open itself.

The locks 303 will be for each pocket and for each system, that is for each bail 305—306, once for all arranged to correspond to a position of fingers determined by the perforations of the card. The sorting may thus take place either according to system I, to system II or to the normal system. It is evident that the sorting

may take place according to the three systems simultaneously. When a cross beam reaches the first pocket for which the arrangement of locks corresponds to the arrangement of the fingers on the cross beam, the pocket will be opened for the card in question. The position of the locks for the different pockets is as follows for the case described:

Pocket	Lock in position to cooperate with a finger in inoperative position		Lock in position to cooperate with a finger in operative position	
	System I	System II	System I	System II
0.....	8	9	0	7,2
1.....	8	9	1	7,3
2.....			11	2
3.....			1	3
4.....		7	8,0	4
5.....		7	9,1	5
6.....		7	9,0	6
7.....		6, 5, 4	9, 11	7
8.....			8	7,4
9.....			9	7,5
11.....			11	7,6
12.....			12	

GEORGES VIEILLARD.