

Feb. 4, 1930.

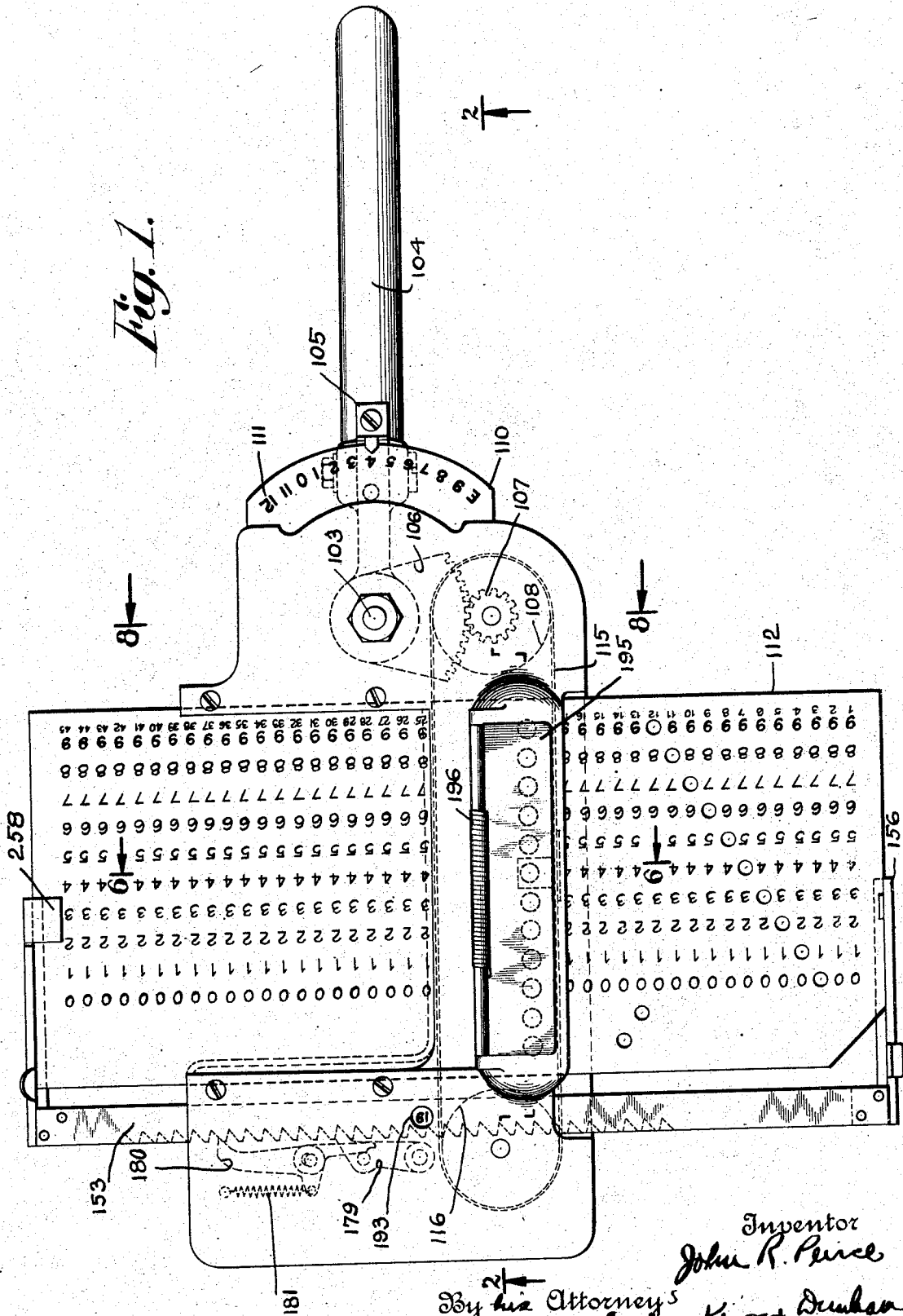
J. R. PEIRCE

1,745,910

HAND PUNCH

Filed June 13, 1925

4 Sheets-Sheet 1



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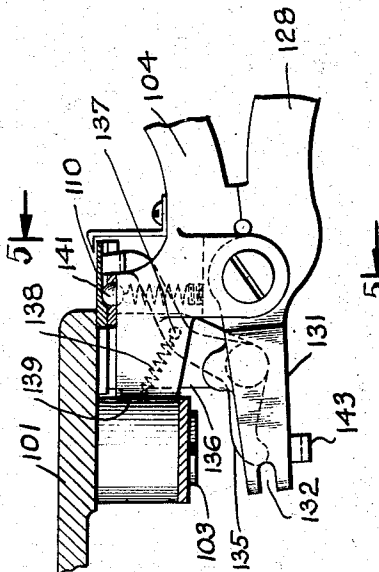
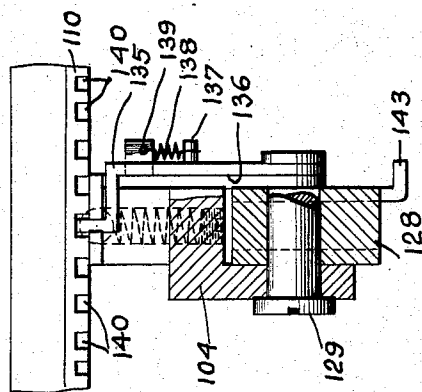
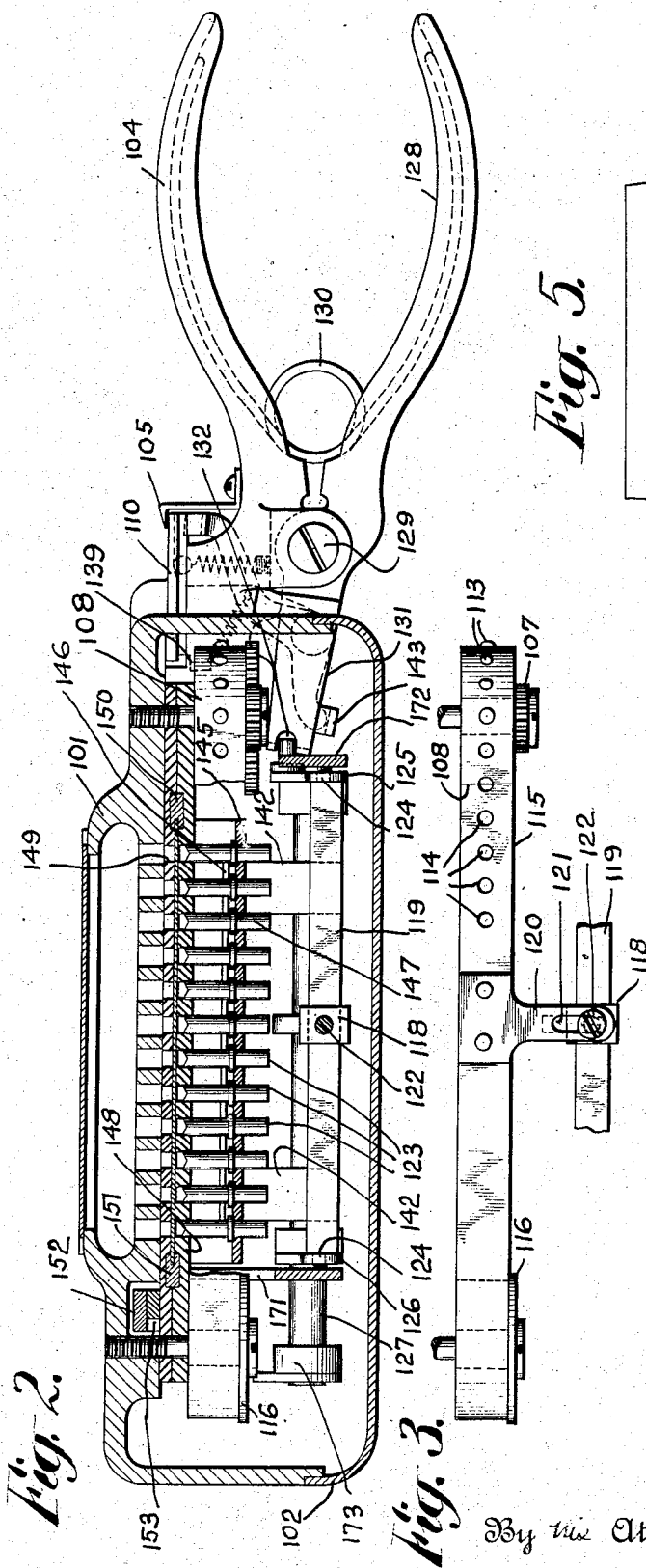
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

Fig. 7.

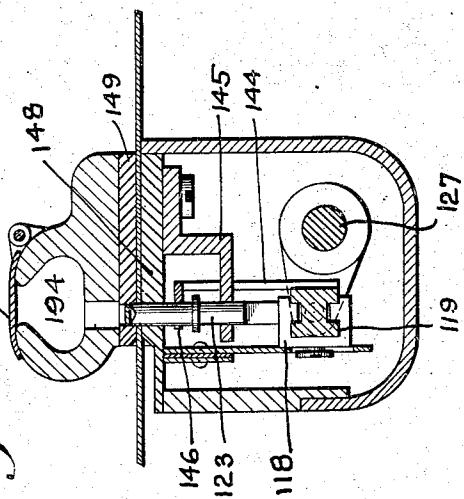


Fig. 6.

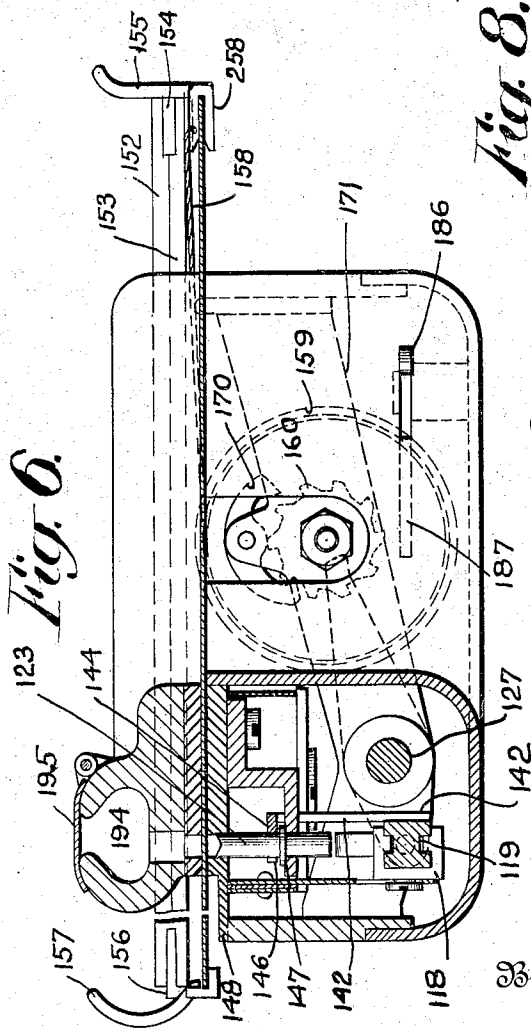
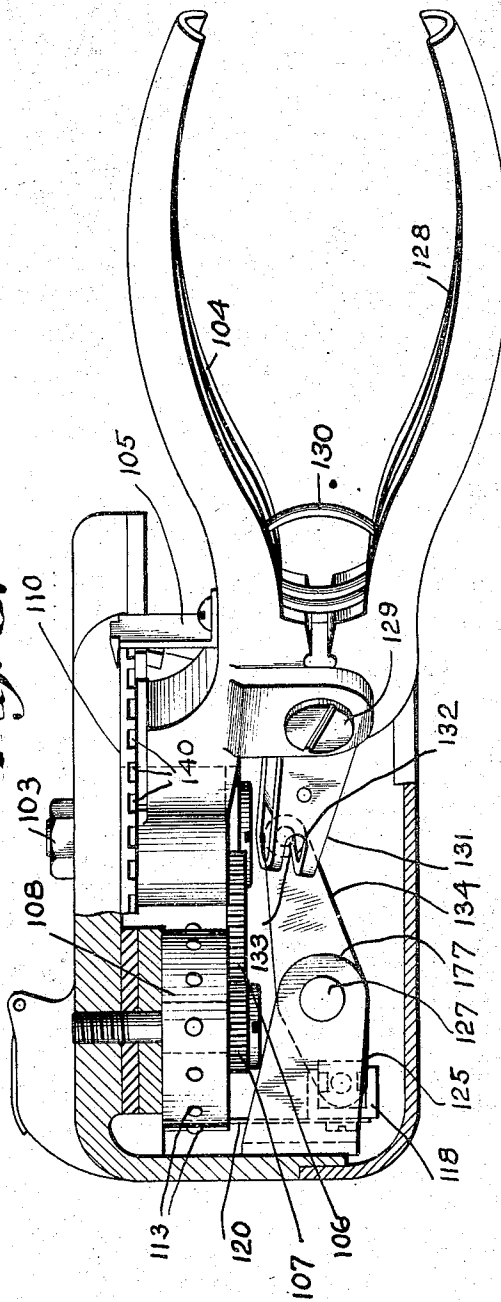


Fig. 8.



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4 Sheets-Sheet 4

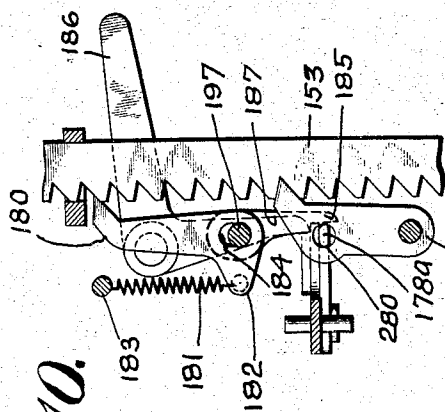


Fig. 10.

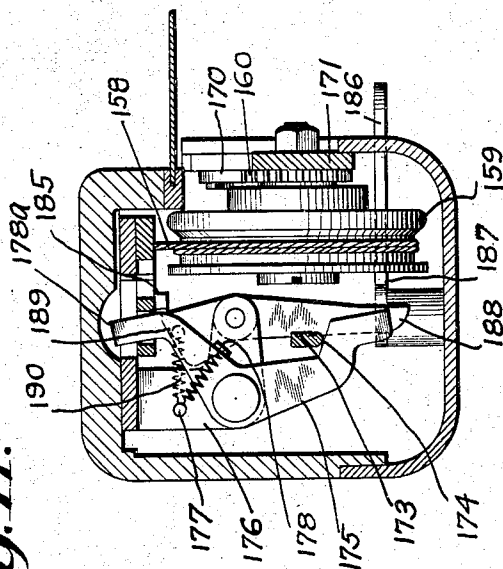


Fig. 11.

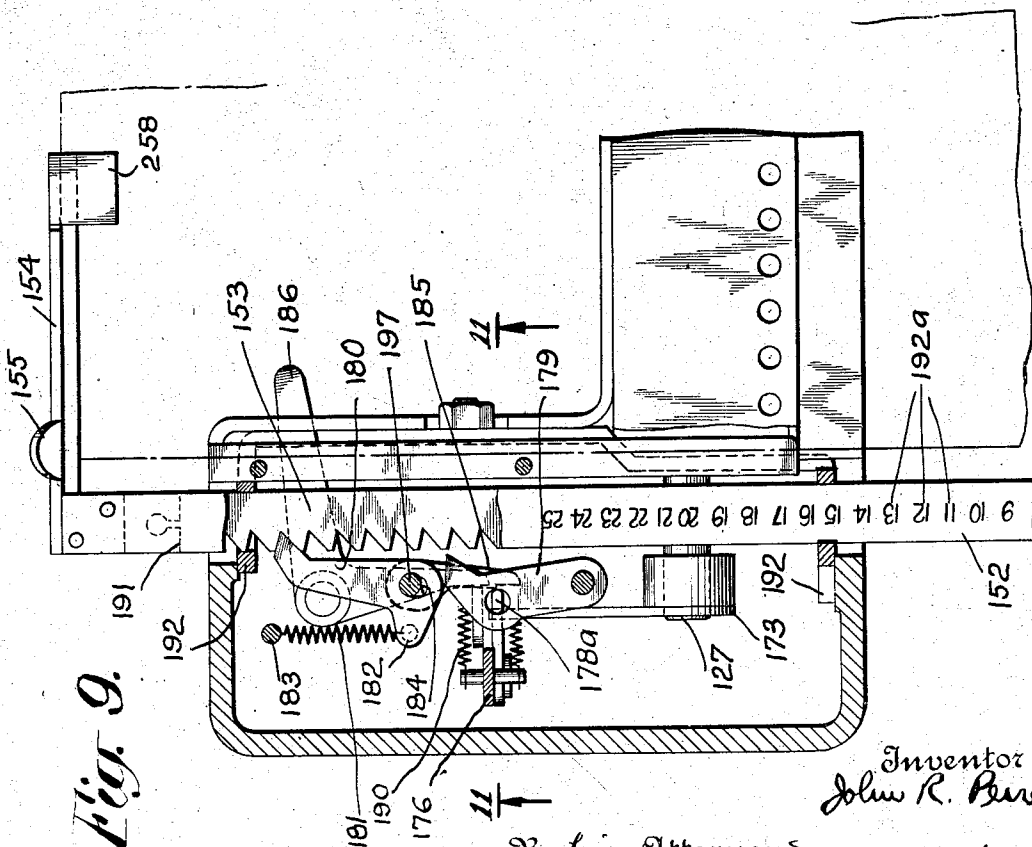


Fig. 9.

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UNITED STATES PATENT OFFICE

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HAND PUNCH

Application filed June 13, 1925. Serial No. 36,795.

This invention relates to card perforating machines adapted for use in the perforated-card tabulating system. In this system the principal machines are the tabulating machine which senses the data contained on the card in the form of perforations and lists such data or accumulates the same or both and subsequently produces a total of the data accumulated; a sorting machine into which indiscriminately mixed cards are placed and the machine sorts the cards into the desired groups; and a perforating machine by which the data is applied to the cards in the form of perforations. The cards are divided into fields or columns, each column containing several index points one or more of which points will be perforated to represent the desired data or other indication. The present invention relates to a machine for producing these perforations. In the system at present the perforating machines are usually designed to be placed upon a desk or table to be operated. While the machines are capable of being conveniently moved about from place to place they are too heavy and cumbersome for field use where the operator must carry the machine with him.

The object of the present invention is to provide a very small, light and compact perforating machine which the operator may conveniently carry about. Such a machine may be used in connection with the reading of gas, electric and other service meters. Thus instead of the operator bringing in at the end of each day a written list of the meters inspected and the data taken therefrom, he places a card in the machine and applies the data relating to each meter and its reading to the card in the form of perforations, at the end of his tour he delivers these cards to the office and they are run through the other machines of the system which automatically produce the desired report sheets in printed form.

Referring to the drawings:

Figure 1 represents a top plan view of the machine.

Figure 2 represents a section through the machine on 2—2 of Figure 1.

Figure 3 is a detail view of the punch selecting band.

Figure 4 is a section showing a locking device for locking the punch selecting arm while the punch operating arm is being operated.

Figure 5 is a section taken on line 5—5 of Figure 4 to further illustrate the locking device.

Figure 6 is a section taken on line 6—6 of Figure 1 showing the punch operating mechanism and the spring drum for actuating the card carrying device.

Figure 7 is a section showing the punch reaching through the card.

Figure 8 is a section through the machine taken on line 8—8 of Figure 1 to show the operating handles and associated parts.

Figure 9 is a partial top plan view of the machine with part of the top broken away to show the escapement for the card carrying device.

Figure 10 is a detail view of the escapement.

Figure 11 is a section through the machine on line 11—11 of Figure 9 to show the means for actuating the escapement pawls.

On Figure 2, 101 is the upper portion of the case, 102 being the lower portion of the case.

Pivotaly mounted to the upper portion 101 by means of stud 103 (Figs. 1 and 4) is the punch selecting handle 104, which is inoperable in a vertical plane but operable in a horizontal plane with stud 103 as its axis. A pointer 105 is fixedly mounted on the handle 104, and cooperates with a fixed plate 110 having thereon a series of numbers, 0 to 12 and the letter E. The numbers on said plate correspond to the numbers on the card 112. When the index points to the position E no hole is to be perforated in the card, but the card will on the next operation escape and present the next column in perforating position.

When the punch selecting handle 104 is swung about, the pointer 105 will indicate on the plate 110 which number will be punched on the card. The selection is effected by means of a gear sector 106 (Fig. 1) fixedly mounted on the handle 104 at its pivotal point.

This sector actuates a wheel 108 by means of a gear 107 fixedly mounted thereon.

About the periphery of said wheel 108 are radial pins 113, which engage a series of holes 114 in the punch selecting band 115 which also rides around an idler wheel 116 and is also supported thereby.

An arm 120 (Figs. 3 and 8), depending from the band 115 has a slot 121 through which a stud 122 passes into block 118. When the band 115 is moved to a position indicated by the pointer 105, said band will slide the block 118 along a bar 119, by means of the depending arm 120, until said block 118 is under a punch 123 corresponding to the number to be perforated.

When the pointer 105 indicates E the block 118 will be in a position where it cannot actuate a punch. The bar 119 has on each end a trunnion 124 (Fig. 2) by means of which the bar is pivoted between arm 125 and arm 126 rigidly mounted on shaft 127.

The punch operating handle 128 is pivotally mounted on handle 104 by means of stud 129. This handle 128 moves in a horizontal plane with handle 104, but is operable vertically with stud 129 as its axis. A coil spring 130 acts to keep the two handles normally apart.

Mounted on the punch operating handle and extending inwardly is a lever 131 having a slot 132 which is so constructed as to be coaxial with stud 103 and engages a stud 133 in a lever 134 extending from arm 125. The slot being coaxial with the stud 103 will therefore engage the stud 133 in any position assumed by the punch selecting handle 104, see Fig. 8.

When the punch operating handle 128 is compressed towards the punch selecting handle 104, lever 131 cooperating with lever 134 will cause the shaft 127 to rock. The arms 125 and 126 will lift bar 119 causing block 118 thereon to force the punch 123 through the card 112, the block 118 being free to move upwards with respect to band 115 due to slot 121 in the depending arm 120 (see Figs. 3 and 7).

To prevent the punch selecting handle 104 from being swung about while the punch operating handle 128 is in operation and in so doing cause the punch to strip or otherwise damage the mechanism, a locking lever 135 is provided and is pivotally mounted on a bracket 136 on the side of the punch selecting arm 104 (see Figs. 4 and 5). On the under side of the indicator plate 110 are notches 140, there being one notch under each character. A spring 138 extending from a stud 137 on the locking lever 135 to a terminal 139 on the bracket 136, tends to force said locking lever into the notches 140. This is normally prevented by a tab 143 (Figs. 2 and 4) projecting from the lever 131 upon which the lower end of the locking lever

normally rests. When the punch operating handle 128 is compressed the tab 143 will move away from the locking lever which will follow said tab 143 until it engages a notch. The return of the handle 128 will not remove the locking lever from the cut until it is almost restored to its normal position thereby allowing the punches to be fully restored before handle 104 can be operated.

To aline the various parts in correct relation to each other a ball detent 141 in the punch selecting handle 104 cooperates with the notches 140, locating said handle in its proper position (Figs. 4 and 5). This will cause all parts to be properly located for punching.

Fastened to the bar 119 and extending upward are arms 142 which support the punch restoring comb 144. The arms are also used to prevent the bar 119 from turning by passing through two guiding slots in the lower punch guide 145. The teeth 146 of the punch restoring comb 144 extend between the punches 123 and restore said punches by depressing the collars 147 fixed on the punches.

The punches are also guided by the upper punch guide 148 above which, allowing an intervening space for the card, is the die plate 149. Between the upper punch guide 148 and the die plate 149 is the front card guide 150 and rear card guide 151 (see Fig. 2).

The card carrying device consists of the card carrying bar 152 having on its under side a rack 153. On the right end an arm 154 extends forward and acts as a stop for the card, the card being held in place by a slotted tab 258 as shown in Figs. 1, 6 and 9. The projecting member 155 is used for shifting the card carrying device. On the left end of the card carrying bar 152 is a similarly constructed arm 156 which also has a projection 157 which can be used to shift the card carrying device.

Attached to the right arm 154 is a draw string 158 extending from a standard typewriter spring drum 159 mounted on a bracket 171. A pawl 170 engaging the ratchet 160 holds the adjusted tension of the spring drum in the well known manner. The bracket 171 also serves as a bearing support for shaft 127 and extends between the inside walls of the upper portion 101 of the case, see Fig. 6. Bracket 172 (Fig. 8) serves as a rear bearing for shaft 127.

Fixedly mounted on shaft 127 is an arm 173 (Figs. 9 and 11) which engages an angular cam surface 174 of the pawl actuating lever 175 which is pivotally mounted on bracket 176. A spring extending between stud 177 and tab 178 holds the pawl actuating lever 175 against the arm 173. A finger 178^a forming part of the lever 175 extends through a hole 280 in the holding pawl 179 which is 130

pivotaly mounted on the upper portion of the case 101.

5 The sliding pawl 180 is pivotaly mounted on the upper portion of the case 101 by means of a stud 197 passing through the elongated slot 184 and is held in engagement with rack 153 by means of spring 181 between stud 182 on the sliding pawl 180 and stud 183. The sliding pawl 180 has an extending arm 185 which projects under the finger 178^a of the pawl actuating lever 175.

10 When shaft 127 is actuated by means hereinbefore described, arm 173 acting against cam surface 174 will cause the finger 178^a to force the holding pawl 179 into engagement with the rack 153. At the same time the finger 178^a will act against the extending arm 185 of the sliding pawl 180 causing said pawl to lift out of engagement with rack 153 and by means of slot 184 slide forward to engage the next tooth of the rack 153.

15 When the shaft 127 returns to normal position the holding pawl 179 will be disengaged from the rack 153 and the rack will go forward until the sliding pawl 180 stops it on the following tooth, see Figs. 9 and 11.

20 To shift the card its full length a bell crank 186, pivoted on the lower portion 102 of the case, has an arm 187 which engages a lever 188 pivoted on bracket 176. The lever 188 on its upper part extends under the arm 185 of the sliding pawl. A spring 190 between studs 177 and 189 holds the lever 188 against the arm 187 of the bell crank 186.

25 When the bell crank 186 is actuated to the left it will cause lever 188 to lift the sliding pawl 180 out of engagement with rack 153. The rack will then be free to move forward until a block 191 stops against the guide 192 which the card carrying device is guided by.

30 When it is desired to shift the card to perforate in a certain column a series of numbers 192^a (Figs. 1 and 9) on the card carrying bar 152 corresponding to the column numbers on the card indicate through a sight hole 193 when the desired column is in its proper position for perforating.

35 A pocket 194 (Figs. 1 and 6) is provided in the upper portion of the case 101 into which all the punchings are forced. The pocket is covered by a cover 195 held down by a coil spring 196. This holds the punchings in the pocket 194 until they can be disposed of.

40 Briefly summarizing, a card is inserted between guides 152 and 153 being advanced till its right end abuts arm 154. The left end of the card is forced over the upper edge of arm 156 and is located thereby. Either projecting member 155 or 157 is then grasped to manually shift the card carriage comprising bar 153 and arms 154 and 156 rearwardly to a position where the first of the card columns to be perforated is above the punches, an indication of which column is in punching position being given through hole 193

(Fig. 1). Assuming that the operator desires to punch the fourth index point position in the nineteenth column, the card carriage is moved till number 19 appears in hole 193. Handle 104 is then swung until the pointer 105 is opposite number 4 on plate 110. This results in rotating gear 107 to move conveyor 108 which through arm 120 slides interposer block 118 along rod 119, positioning it beneath the "four" position punch, as shown in Fig. 1. The handles 104 and 128 are then grasped and the latter moved upwardly towards handle 104. The slotted portion 132 on the inner end of the handle 128 thereupon rocks arm 134 and shaft 127 clockwise. Rod 119 thereupon moves upwardly and the interposer block 118 moves correspondingly being guided in slot 121 of arm 120. The block 118 in its movement forces punch "four" through the card. When shaft 127 is rocked, the arm 173 (Figs. 2, 9 and 11) acts against cam surface 174 of pawl actuating lever 175 and causes the latter to force the holding pawl 179 into engagement with rack bar 153 and simultaneously release pawl 180 from the rack bar. The latter pawl will slide forward to engage the next tooth of rack 153. When the handle 128 returns to its normal position after the punching operation, shaft 127 rocks arm 173 away from cam surface 175 and pawl 179 is disengaged from rack 153 which goes forward under force of spring drum 159 until the pawl 180 stops it on the following tooth (see Figs. 9 and 11). Thus, each time a punch is operated to perforate the card, the rack bar is advanced and the card moving therewith is positioned for a punching operation in the next column.

45 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 to be limited therefore only as indicated by the scope of the following claims.

50 Having described my invention what I claim and desire to secure by Letters Patent is:

1. In a record-perforating machine, a plurality of punches, a conveyor, an interposer connected to said conveyor, means for adjusting said conveyor comprising a revoluble handle and gear mechanism interconnecting said conveyor and said handle and means for manually actuating said interposer for operating the punches.

2. In a record-perforating machine, a plurality of punches, an interposer, a movable handle for adjusting said interposer into co-operative relation with any of said punches and means movable relative to said handle for

actuating said interposer to operate the punches.

3. In a record-perforating machine, a plurality of punches, an edless conveyor, an interposer carried by said conveyor, means for actuating said conveyor to adjust the interposer with respect to the punches and means for actuating the interposer to operative position.

4. In a record-perforating machine, a plurality of punches, an endless conveyor band, an interposer attached to said band, means for actuating said band to adjust said interposer with respect to said punches and means for actuating the interposer to operate the punches.

5. In a record-perforating machine, a plurality of punches, a sprocket wheel, a conveyor mounted on said wheel, an interposer attached to said conveyor for adjustment with respect to said punches, means for actuating said sprocket wheel for adjusting said interposer and manually actuated means for actuating said interposer to operate the punches.

6. In a record-perforating machine, a plurality of punches, a sprocket wheel, an endless conveyor associated with said sprocket wheel, an interposer connected to said conveyor, a manually actuated selector geared to said sprocket wheel for adjusting said interposed with respect to said punches and means for manually actuating the interposer to operate the punches.

7. In a record-perforating machine, a plurality of punches, a rotatable handle for selecting one of said punches for operation, manual means comprising a handle connected to said rotatable handle for effecting the operation of the punches and means associated with said manual means for locking said selecting means against operation while said manual means is out of normal position.

8. In a record-perforating machine, a plurality of punches, a bail, an interposer associated with said bail, means for adjusting said interposer along said bail and means for actuating said bail for pressing said interposer against the punches to operate the same.

9. A record card perforator comprising a plurality of punches, a member for forcing the punches selectively through a record card, a movable handle for adjusting said member into cooperative relation with a selected punch, and means associated with said handle and adapted to be manually grasped for operating said member to effect actuation of the selected punch.

10. A record card perforator comprising a plurality of punches, an interposer and a pair of connected handles adapted to be moved as a unit for adjusting said interposer into cooperative relation with any of said punches, said handles being moved relatively to each other

for operating the interposer to actuate the selected punch.

11. A record card perforator comprising a plurality of punches, an interposer, a movable handle for adjusting said interposer into cooperative relation with any of said punches, means associated with said handle for actuating said interposer to operate the punches, and means for automatically feeding the card after actuation of the selected punch.

In testimony whereof I hereto affix my signature.

JOHN ROYDEN PEIRCE.

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