Jan. 23, 1934. J. T. SCHAAFF 1,944,671

RECORD PERFORATING DEVICE

Filed July 6, 1931 5 Sheets-Sheet 1

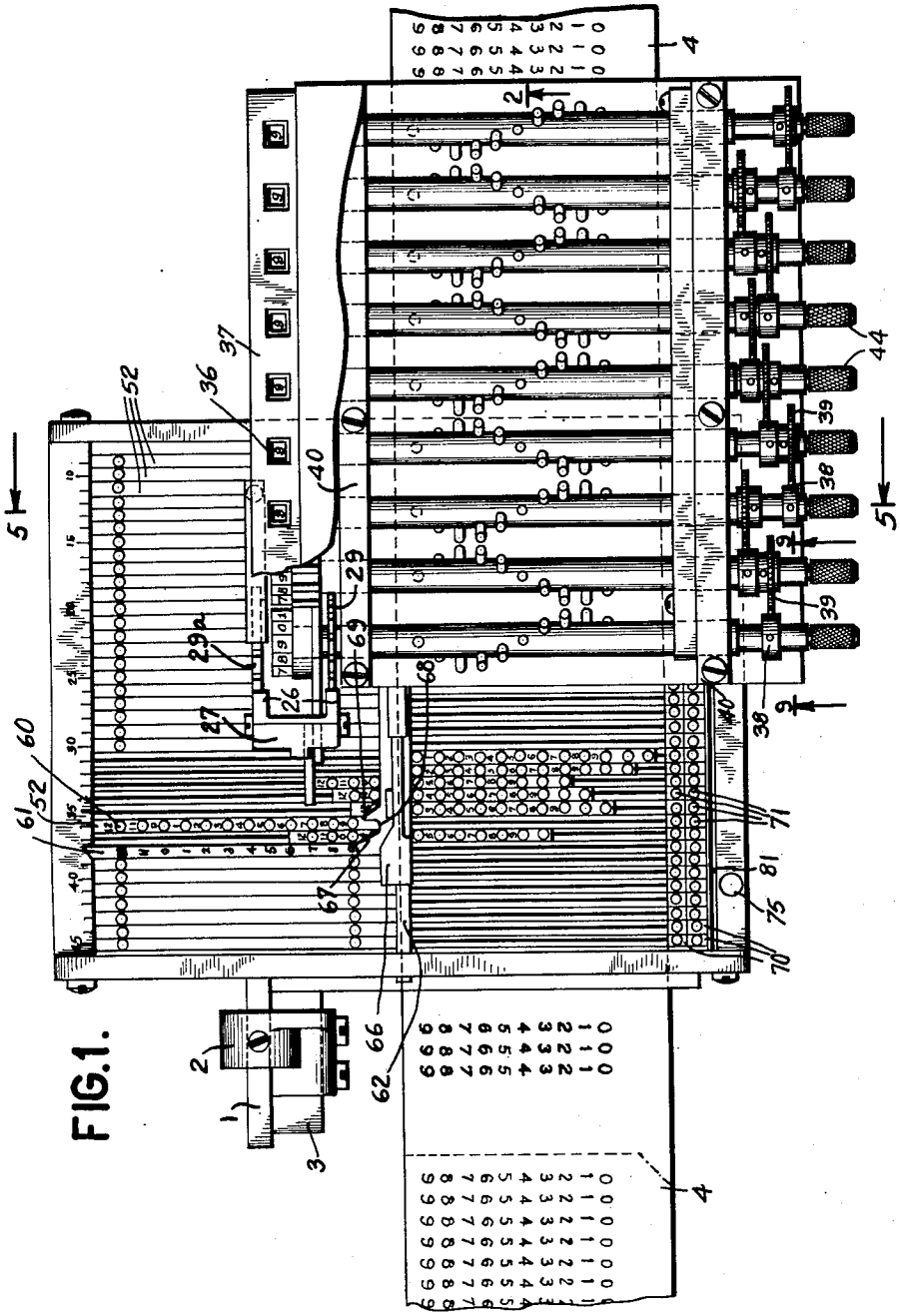


FIG. 1.

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RECORD PERFORATING DEVICE

Filed July 6, 1931 5 Sheets-Sheet 2

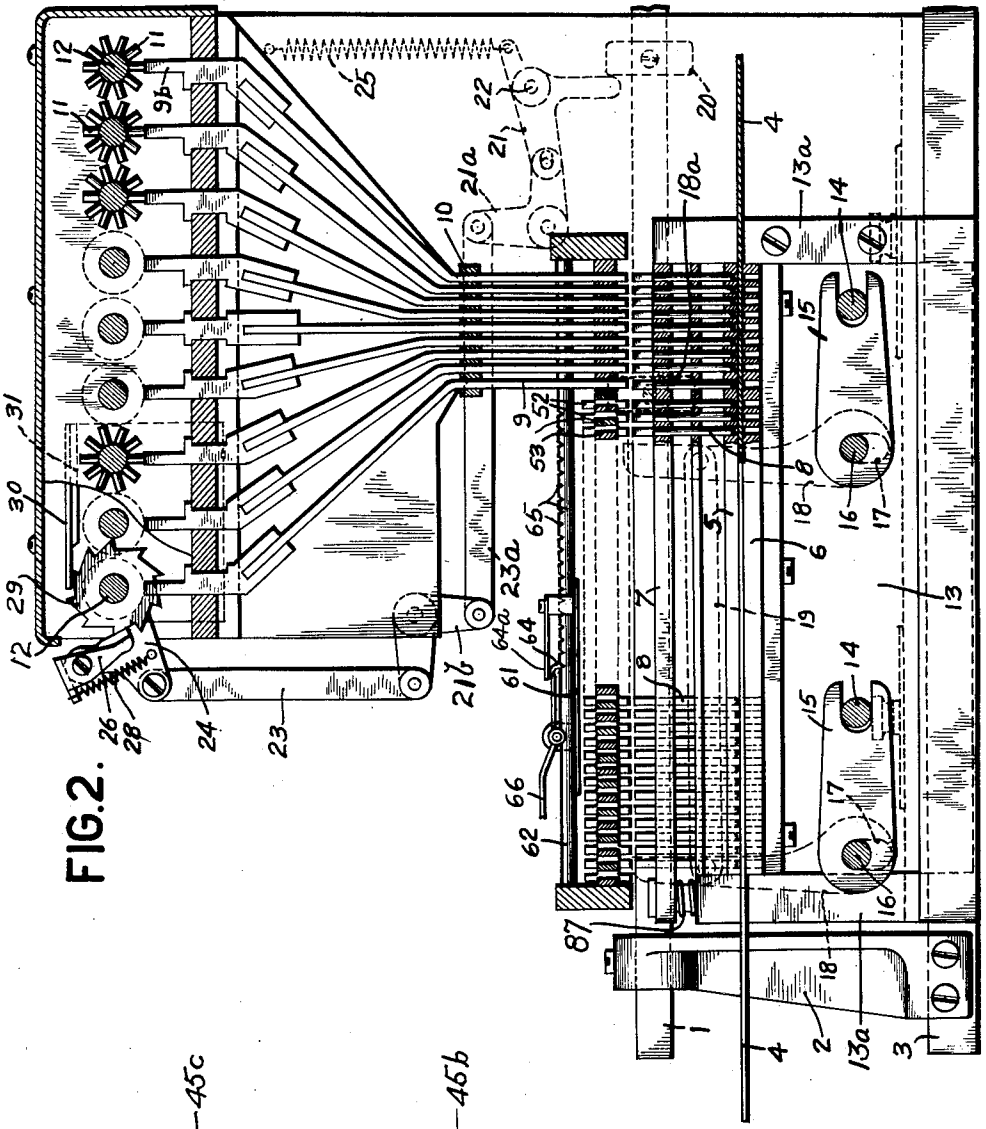


FIG.2.

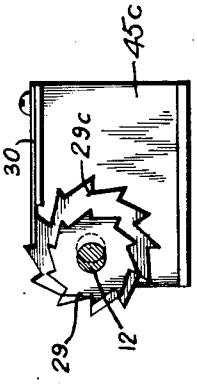


FIG.3.

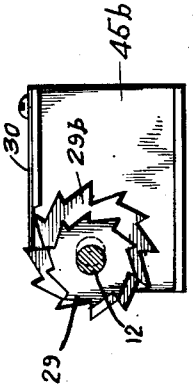


FIG.4.

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RECORD PERFORATING DEVICE

Filed July 6, 1931 5 Sheets-Sheet 3

FIG.5.

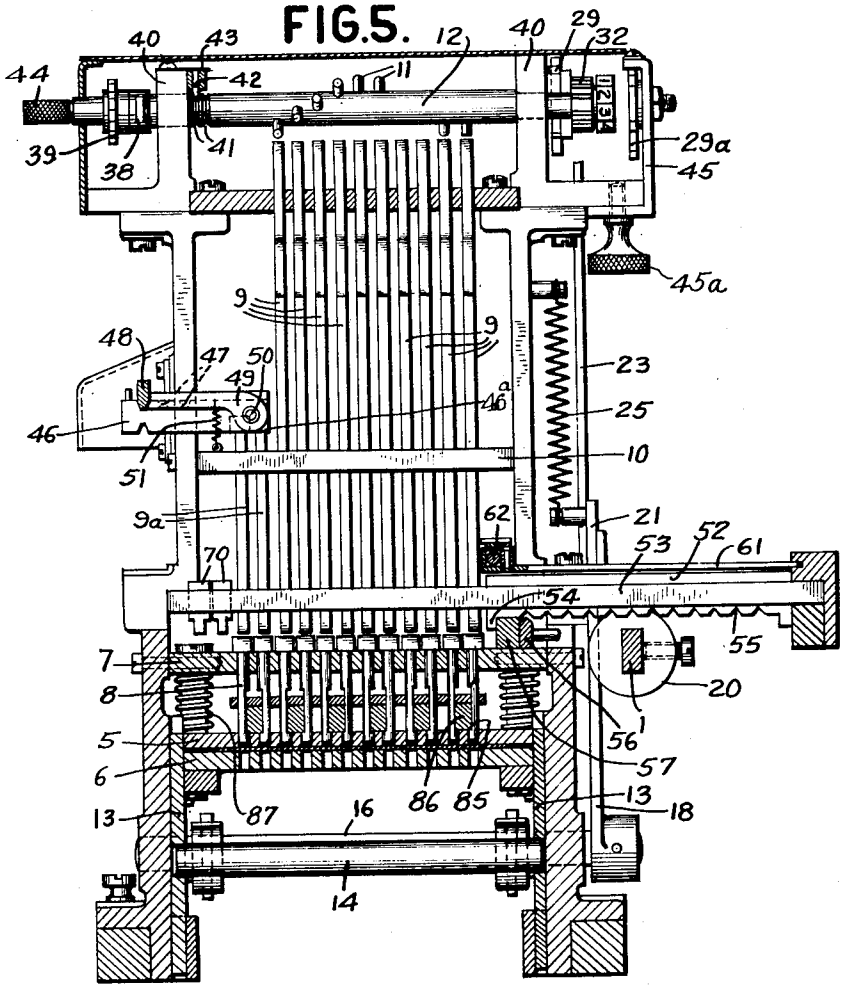


FIG.6.

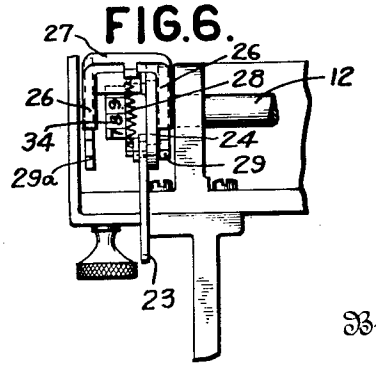
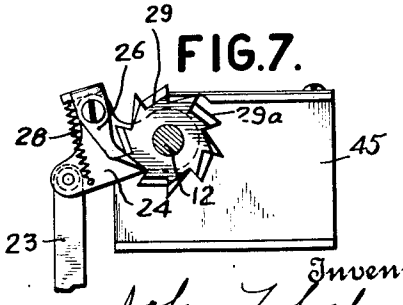


FIG.7.



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RECORD PERFORATING DEVICE

Filed July 6, 1931 5 Sheets-Sheet 4

FIG.8.

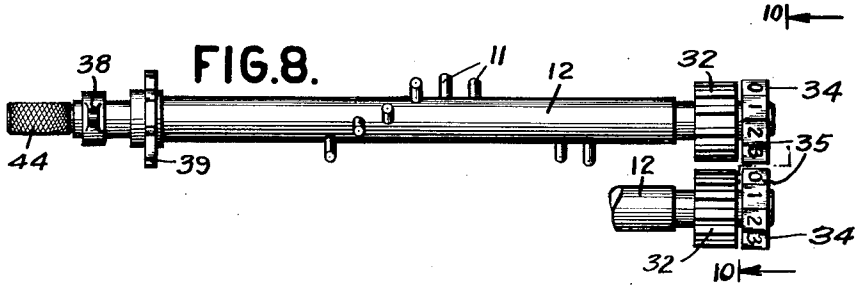


FIG.9.

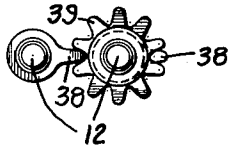


FIG.10.

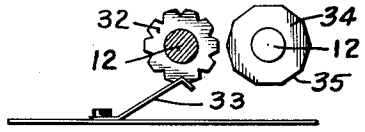


FIG.12.

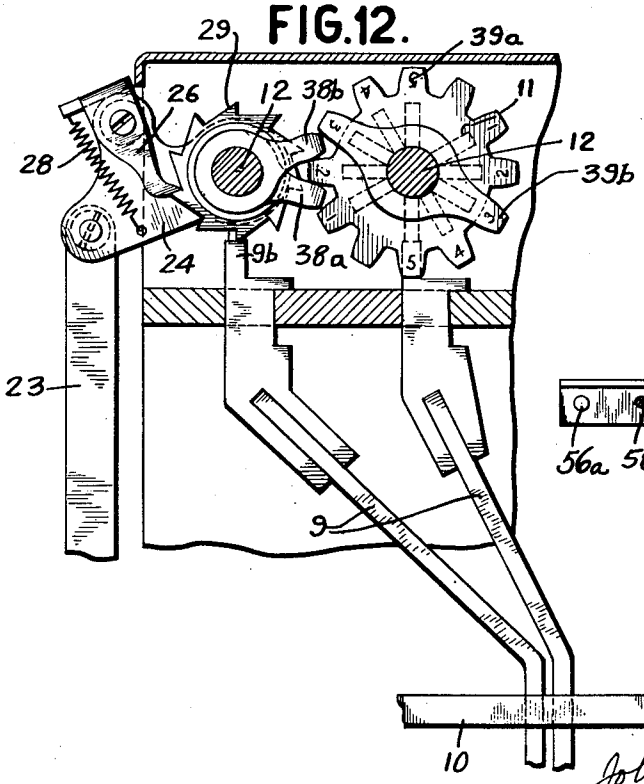
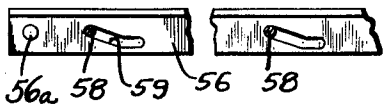


FIG.11.



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RECORD PERFORATING DEVICE

Filed July 6, 1931 5 Sheets-Sheet 5

FIG.13.

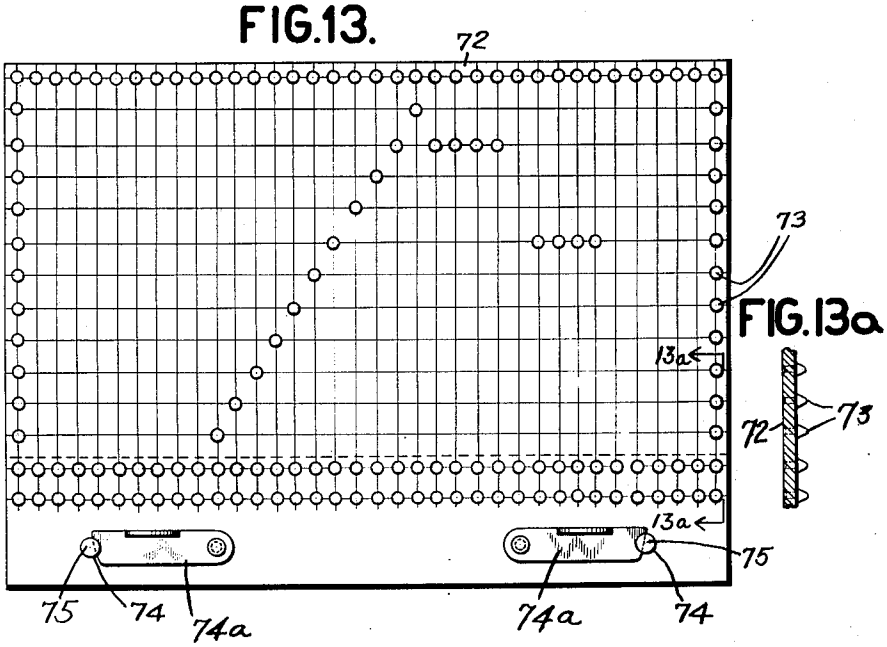


FIG.13a

FIG.14.

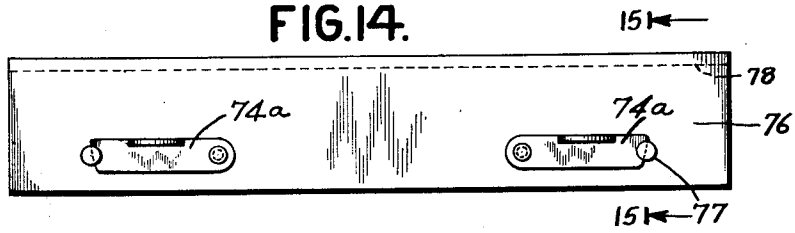


FIG.16.

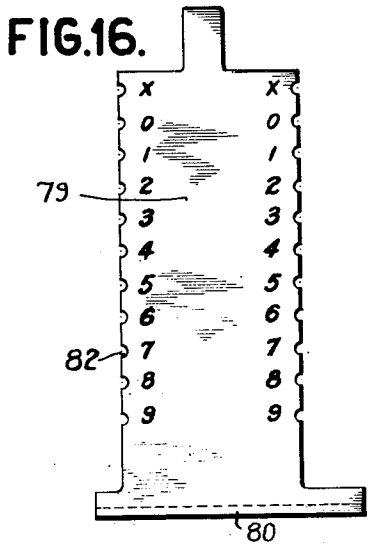
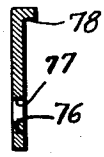


FIG.15.



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Patented Jan. 23, 1934 1,944,671

UNITED STATES PATENT OFFICE

1,944,671

RECORD PERFORATING DEVICE

John T. Schaaff, Washington, D. C., assignor, by mesne assignments, to International Business Machines Corporation, New York, N. Y., a corporation of New York

Application July 6, 1931. Serial No. 548,904

12 Claims. (Cl. 164—111)

This invention relates to perforated card numbering machines. More particularly it relates to machines for serially numbering successively presented cards by making perforations in the cards representing the numbers. It also relates to means for gang punching the cards or, in other words, for punching a group number in successively presented cards.

One of the objects of the invention is to devise mechanism whereby cards may be punched serially or serially in duplicates, triplicates, quadruplicates, etc.

Another object is to provide means for serially punching numbers in cards up to a given number say fifty and then repeating such numbering so as to produce a number of groups of cards all serially numbered from one to fifty or to some other desired number.

Another object is to provide means for punching common group numbers in successively presented cards in which the mechanism may be quickly set to control punching of the desired number and the parts locked in set position so as not to accidentally change during the operation of the machine.

Another object is to provide a machine of this character which may be used as an attachment to a printing press in which tabulating cards are printed and cut.

These and other objects will be apparent from the following description of the machine.

Referring to the drawings wherein I have shown what I now consider to be a preferred form of my invention:

Fig. 1 is a plan view of a machine adapted to be used as an attachment to a printing press or separately;

Fig. 2 is a sectional side elevation taken on line 2—2 of Fig. 1;

Fig. 3 is a detail of a control device for producing four cards of each number;

Fig. 4 is a similar detail of a device for producing three cards of each number;

Fig. 5 is a sectional elevation taken on line 5—5 of Fig. 1;

Fig. 6 is a detail of the mechanism for controlling the changing of the numbering after one or two or some other quantity of cards bearing a given number has been produced;

Fig. 7 is a detail similar to Figs. 3 and 4 of a device for causing the machine to produce two cards of each number;

Fig. 8 is a detail of a rotor or spindle having projections for consecutively changing the control over the punches;

Fig. 9 is a section taken on line 9—9 of Fig. 1;

Fig. 10 is a section taken on line 10—10 of Fig. 8;

Fig. 11 is a detail of means for locking a gang punch setting in its set position;

Fig. 12 is a sectional detail of part of the mechanism shown in Fig. 2 with modifications for serially numbering several groups of cards from one to fifty;

Fig. 13 is a plate for locking a group number setting in the machine;

Fig. 13*a* is a sectional detail taken on line 13*a*—13*a* of Fig. 13;

Fig. 14 is a plan view of means for locking certain group numbering control means out of operative position;

Fig. 15 is a sectional detail of the device of Fig. 14, taken on line 15—15 of Fig. 14;

Fig. 16 is a plan view of a guide for determining the setting of certain group numbering control devices.

In illustrating my invention, I have shown a device which may be operated in conjunction with a printing press or independently thereof and in which the actuation of the mechanism is effected by the reciprocation of a bar 1 which may be operatively connected to a printing press or to any other driving means. The bar 1 is slidably mounted in a bracket 2 fixed to the base 3 of the machine. The tabulating cards which are to be numbered by this machine are produced from a long strip of material 4 which is fed from a reel at the left as viewed in Fig. 1, through the machine and is cut, preferably, after the printing and punching has been effected. Where the machine is used in conjunction with a printing press which is used to make up such cards, the strip 4 is first fed through the press where the printing of the desired numerals and other data is effected. It is then fed into the gang punch and then into the serial numbering machine to have the serial or other numbering effected in the form of perforations. Or if desired the strip 4 may be fed through the numbering machine first and then through the printing press. In either event the feeding through both machines will be coordinated so that the strip 4 will stop in such position as to receive the printing impression and punching in the proper locations. Such positioning means as well as means for cutting the strip into separate cards is common in printing presses for making up such cards and therefore need not be disclosed in the present device.

The strip of paper is fed between upper and lower die plates 5 and 6. Mounted in the upper

die plate 5 and also supported by a stationary guide plate 7 are the punches 8 for perforating the cards. There are twelve of these punches to each row or column and if there are forty-five columns there may be forty-five such columns of punches so that prepunching may be effected in any of the columns desired.

For convenience, I have shown the nine columns of punches at one end as being under control of the serial numbering device and all of the rest of the columns of punches as being adapted to be used for punching group numbers in the cards. In Fig. 2 the nine columns of punches at the right are the ones employed for serial numbering. Directly above these punches are interposer rods 9. There is one of these rods for each punch, or in other words, nine columns of twelve to each column. As shown in Fig. 5, ten of the rods in each column are of full length while two, i. e. those designated 9*a* are shorter. The rods 9*a* are adapted to cooperate with the punches for perforating in the "11th" and "12th" positions on the card and are not used in serial numbering as only ten are necessary for this purpose. The ten rods 9 reach upwardly through a guide plate 10 and then spread outwardly as shown in Fig. 2 so as to cooperate with pins 11 fixed in rotors 12. There are nine of these rotors each having ten of the pins 11. Each of the pins is adapted to cooperate with one of the rods 9 and each of the rotors is associated with one of the nine columns of rods 9. The pins 11 are arranged spirally on the rotor so that as the latter is turned step by step the pins will be moved successively into cooperative positions with respect to the rods 9. Thus assuming that a rotor is in such position that one of the pins is in position directly above the upper end 9*b* of the rod associated with the punch adapted to perforate in the "5" position in its column of the card, rotation of the rotor one step will remove the "5" pin from operative position and move the next pin over the rod 9 associated with the punch that is adapted to perforate in the "4" position on the card, etc.

In serially numbering a group of cards, I prefer to number them in a descending order so that they will be deposited with the card of the highest number at the bottom of the stack and the lowest number at the top. If it is desired to prepare a stack of cards numbered from 1 to 100,000 the rotors 12 will be set so that the first card punched will be numbered 100,000. After punching this card the rotors will be turned one point so that the next card will be numbered 99,999 and so on down. The changing is effected by turning the units rotor one point after each operation. The rotors are turned backward and when any rotor is turned from "0" position to "9" position it effects a carry operation to the rotor of the next higher denominational order. Thus, when the units rotor is turned after the punching of the first card it causes the tens rotor to turn one point. As the tens rotor then turns from "0" to "9" position, it causes a carry operation of the next higher rotor, etc., the hundreds of thousands rotor turning from the "1" position to "0" position, so that the second card will be punched 099,999.

The perforating of the card is effected by moving the die plates 5 and 6 upwardly so as to press the card against the lower or cutting ends of the punches 8.

The card will then raise all of the punches except those that are held down by the rods 9 and only those rods 9 that are directly under pins 11 on the rotors will hold their rods down to prevent the corresponding punches from being raised by the card. These punches then will perforate the card.

In order to effect raising of the die plates the latter are attached to side plates 13 which are adapted to be moved up and down. These plates are provided with studs or rods 14 with which slotted arms 15 cooperate. The arms 15 are fixed on rods 16 which bear in the side frame of the machine and pass through slots 17 in the plates 13 and the latter are free to move up and down being guided by plates 13*a*. Also fixed on the rods 16 are arms 18. These arms are interconnected by a link 19 and at least one of the arms reaches upwardly where it will be actuated by a collar 18*a* fixed on the rod 1. When the rod 1 is moved to the left as viewed in Fig. 2 the die plates will be raised so as to move the card into engagement with all of the punches to effect punching in those positions where the punches are held down by the rods 9 in cooperation with the pins on the rotors. Each time the rod 1 is moved to the left, collar 20 fixed thereto is adapted to engage and to actuate an arm 21 pivoted at 22 and connected by bell cranks 21*a*, 21*b* and links 23, 23*a* to a pawl-carrying frame 24 loosely mounted on the units rotor 12 or concentric therewith. The movement of the rod 1 to the left causes the frame 24 to be raised so as to turn a short distance in a clockwise direction about the units rotor 12.

When the rod 1 moves to the right the rotor turning spring 25 lowers the links 23 and frame 24 and springs 87 lower die plates 5 and 6. The frame 24 carries two pawls 26. These pawls are integral, being formed in the shape of a U or in other words, joined by the yoke 27 so that they rock together in the frame 24. A spring 28 tends to rock the pawls in a counterclockwise direction as viewed in Fig. 2 so as to cooperate with a ratchet 29. When performing simple serial numbering only one of the pawls 26 is effective. The other is used when more than one card of each number is desired as will be described presently. Each time the frame 24 is raised and lowered it turns the ratchet 29 one tooth space to shift the pins 11 to effect punching of the next numeral in the following cycle of operation of the machine.

A leaf spring 30 fastened at 31 may be employed to engage the ratchet 29 to impositively hold the latter in any position to which it is turned by the pawl 26. Fastened to all of the rotors 12 excepting the one of the units order is a star wheel 32 (see also Fig. 10) with which a spring 33 cooperates to act as an impositive latch to latch the rotors in any set position. Also fixed to each of the rotors is a wheel or disk 34 which may be provided with ten flattened surfaces 35 bearing indications of the ten numerals which may be visible through openings 36 in a cover plate 37 as in Fig. 1. These visible numerals indicate the position of the respective rotors, that is, a numeral indicates that the rotor is in position to effect punching of that particular value on the card during the next operating cycle.

Referring to Fig. 1 carrying from one rotor to the next is effected by means of a one tooth gear 38 (see also Fig. 9) adapted to cooperate once each revolution with a tooth in the gear 39 mounted on the rotor of the next higher order. Each of the rotors except the one of the highest order is provided with a one tooth gear 38 to cooperate with a ten tooth gear 39 on the rotor of the next higher order and each of the rotors except the one of

the lowest order is provided with one of these ten tooth gears 39 to be actuated by the one tooth 38 of the rotor of the next lower order. When the serial numbering is not to employ all of the rotors those which are not in use may be moved to inoperative position. For this purpose, the rotors are adapted to be slid longitudinally in their supporting frame 40. Each rotor is provided with two circumferential grooves 41 as shown in Fig. 5 adapted to cooperate with a detent 42 pressed by a spring 43 into the groove.

A knurled handle 44 is provided on the end of each rotor to permit the operator to slide the rotor to either operative or inoperative position. The detent 42 will be cammed out of one groove and permitted to drop into the next to thus hold the rotors in their operative or inoperative position. Resetting of the rotors may also be effected by moving them to inoperative position, demeshing gears 38, 39 and then turning them to their zero or other desired position.

Punching duplicate numbers

In order to punch two cards of each number a bracket 45 carrying an additional ratchet wheel 29*a* is provided to cooperate with the second of the pawls 26 (Figs. 5, 6 and 7). The ratchet 29*a* is rotatably mounted on the plate 45 secured to the machine by screw 45*a* and is coaxial with the rotor 12 of the units order. This ratchet is provided with ten teeth. Every other tooth or notch is of sufficient depth to permit the pawls 26 to be moved inwardly a sufficient distance to cooperate with the ratchet 29 fixed on the rotor. Thus, when the frame 24 and pawls 26 are lowered the ratchet 29 will be actuated to turn the rotor one step. The intermediate notches in the ratchet 29*a* are shallow so that when one of the pawls 26 is resting in such notch the other will be held out of cooperation with the ratchet 29. Then, when the frame 24 and pawls 26 are lowered the ratchet 29 will not be actuated and the rotor will remain in the same position that it occupied during the last cycle of operation and the same number will be punched in the next card that was punched in the previous card. The rotor of the units order will be turned one step every other cycle of operation of the machine so that throughout the entire operation of serial numbering, two cards of each number will be produced.

Punching three or more cards of each number

In order to punch three cards of a number the ratchet 29*a* with plate 45 is removed and a ratchet 29*b* on plate 45*c* (Fig. 4) put in its place. This ratchet is larger than the ratchet 29*a*, being provided with twelve teeth and twelve notches and is therefore mounted eccentrically with respect to the rotor 12. In Fig. 4 every third notch in the ratchet 29*b* is a deep notch and the two intermediate notches are shallow. Thus, the pawl 26 which cooperates with the ratchet 29*b* will turn the ratchet two idle strokes before it is permitted to enter a deep notch to enable the companion pawl to engage the ratchet 29 to actuate the latter.

Thus, ratchet 29 mounted on the units rotor will be actuated once for each three cycles of operation of the machine. In this way, three cards bearing each number will be produced. In Fig. 3 a ratchet wheel 29*c* on plate 45*c* is used in place of the wheel 29*b*. Ratchet 29*c* is provided with a deep notch at every fourth tooth. This will cause the pawls 26 to operate idly for three cycles and to turn the units rotor during the fourth cycle so that the serial number changes after four cards bearing a given number have been punched.

Serial numbering cards up to a predetermined number

It is sometimes desirable to produce a stack of cards numbered serially up to say 50 or 100 or some other number; each stack being a repetition of the others or in other words, each stack has cards numbered from 1 to 50 or from 1 to 100 as desired. To effect this punch numbering, I provide means to control the rotors to serially number cards from 1 to the desired number and then to commence numbering the next stack from the beginning. Preferably the cards are numbered in the descending order.

In the illustration in Fig. 12, I disclose a device adapted to effect the numbering of the cards from 50 down to 1 and to then return to number 50 of the next stack, numbering the next stack from 50 to 1. The device is adapted to keep up this operation as long as desired. For this purpose, the device is constructed as shown in Fig. 12 with the rotors 12 of the units and tens order placed farther apart so as to permit the use of the larger gear 39*a* on the rotor 12 of the tens order. The rotor of the units order is provided with two of the carrying gear teeth 38*a*, 38*b*. The gear 39*a* is of sufficient size to carry twelve teeth but is only provided with ten, leaving two open spaces on opposite sides.

A mutilated gear 39*b* having but two teeth is fixed beside the gear 39*a* with its teeth adjacent to the positions on the gear 39*a* from which the two teeth are omitted. The carry tooth 38*a* on the units rotor is adapted to cooperate with one of the teeth in the gear 39*a* once each complete revolution of the units rotor, until it has actuated the tens rotor five times. This will then bring one of the teeth 39*b* into position to be actuated by the other carrying tooth 38*b* so that on the next time around it will turn the tens rotor one step. The pins 11 on the tens rotor in this instance are arranged in two groups corresponding to the punches one to five. In other words, the pins in one of the groups will bring into operation the punches from one to five and the pins in the other group will do the same. Both sets of pins are thus numbered from 1 to 5. In the operation of this device, the numbering will commence with the rotor 12 of the tens order in such position that one of the "5" pins 11 will be above corresponding column of rods 9 to punch "5" in the tens order.

On the other hand, the "0" pin 11 on the rotor of the units order will control punching for the first cycle of operation numbering the card 50. Then the tooth 38*a* will cooperate with a gear tooth 39*a* turning it one step to bring into operative position the "4" pin 11 of the group to cause "4" to be punched in the tens order, the units rotor turning to "9".

The card numbered 49 will then be punched and deposited on top of the card numbered 50. The units rotor will then turn one step for each card punched until the card numbered 40 has been punched. Then as the units rotor is turned one point the carry tooth 38*a* cooperating with one of the teeth of gear 39*a* will turn the tens rotor one step to bring the "3" pin into operative position, the units rotor turning to "nine" position. This will cause card numbered 39 to be punched. The tens rotor will not be turned again until card numbered 30 has been punched where-

upon the carry tooth 38*a* will turn the tens rotor another step bringing the two pin into operative position, the units rotor once more turning to the "nine" position. This operation goes on until a card numbered 10 has been punched after which the operation of the units rotor will move the tens rotor into position where none of the pins 11 will cooperate with the punches so that there will be no punching in the tens column. The units rotor on the other hand would have turned to the nine position to punch the card numbered nine. The units rotor continues to turn one point for each card punched until card numbered "1" has been produced. Now as the units rotor is turned one more step the carry tooth 38*b* cooperating with the carry tooth 39*b* will turn the tens rotor one step bringing the five pin into operative position, the units rotor turning to zero position. The card numbered 50 of the next group will now be punched.

It will be seen here that as the units rotor turns one more step to the nine position the carry tooth 38*a* cooperating with one of the teeth of the gear 39*a* will turn the tens rotor one step to the four position. The card numbered 49 will now be punched. The operation will then continue as described punching the cards consecutively on down to card number "1" of this second series and then a third series numbered from 50 down to one will be produced, etc.

If larger groups of cards are desired, for instance, if the groups are to contain 60 cards, then the groups of pins 11 on the tens rotor may be increased to six pins each, the number of teeth in the gear 39*a* and the position of the teeth 39*b* being arranged accordingly.

Also if the groups are to contain 100 or several hundreds of cards then a 3rd rotor will be employed to control the punching in the 100's order and appropriate carrying will be provided from the rotor of the tens order to that of the 100's order. The manner in which this will be carried out will be sufficiently obvious to those skilled in the art and therefore need not be disclosed in detail here.

The "11" and "12" positions

In serially numbering the cards only the positions from zero to nine are used; the punches for the "11" and "12" positions remaining idle. There are instances, however, where it may be desired to effect predetermined punching in the "11" and "12" positions. For this purpose rods 9*a* (see Fig. 5) are provided above the punches 8 of the "11" and "12" positions. Above these rods is a slide 46 having three notches 47 in its upper edge adapted to cooperate with a latching member 48 carried by arms 49 and pivoted at 50. A spring 51 is provided to hold the latching member 48 in cooperation with the notches in the slide 46. The slide is provided with a downward projection 46*a* adapted to be set over one or the other of the rods 9*a* to control the operation of the "11" or "12" punches.

Gang punching

In addition to serially numbering cards it is sometimes desired to prepunch group numbers in the cards. In other words, for statistical purposes, the cards are often divided into large groups and each group is punched with the group number, all of the cards of a given group bearing the same group number. This number is ordinarily punched when the other statistical data is being applied to the cards, but in many instances, can be applied when the cards are being printed.

I have devised means in the present machines for prepunching these group numbers or to use the common language of the art for gang punching the cards.

Referring to Fig. 2 all of the columns of punches 8 except the nine at the extreme right associated with the serial numbering are adapted to be used in prepunching group numbers. For this purpose a slide bar 52 is mounted above each column of punches. These bars are all provided with longitudinal grooves so that they may fit upon supporting bars 53. The end of each slide 52 is provided with a downward projection 54. As shown in Fig. 5 the projection 54 is in its inoperative position and may be slid into position above any one of the twelve punches 8 so that when the die plates 5, 6 with the card are raised against the punches, a perforation will be made in the position corresponding to the punch above which the projection 54 is located. Wherever group number punching is to be effected the slides 52 in those particular columns are moved into position to control the proper punches. All of the rest of the slides are left in their normal or inoperative position. Those of the slides that have been set as well as those that have not are then all locked in position so that they shall not move during the operation of the machine. For this purpose, all of the slides are provided with twelve notches 55 in their lower edges. A locking bar 56 (Figs. 5 and 11) is mounted on the frame member 57, being held by pins 58 fixed to the member 57 and cooperating with diagonal slots 59 in the strip 56.

The slots are diagonally disposed so that when a locking bar is moved to the right as in Fig. 11, it will be lowered to the position of Fig. 5. When it is moved to the left, however, as viewed in Fig. 11, it will be raised from the position of Fig. 5 into cooperation with the notches 55 in the slides. A pin or handle 56*a* is provided on the bar by which it may be adjusted. The slots 59 are provided with dwells at their lower ends to hold the bar in raised position. As shown in Fig. 1, the slides 52 may be provided with designations corersponding to the 12 index point positions in each column on the card. Directly under each designation is a shallow hole 60. To set the slide in position to effect prepunching of a particular numeral the operator will insert a stylus or pencil point into the hole 60 directly below the numeral which is to be punched in that column and move the slide downwardly as far as he can. Slidably mounted over the slides 52 is an index finger 61 reaching the full length of the slides 52 and carrying designation numerals corresponding to the index points on the card. Each numeral on the index finger is adjacent to the hole 60 in the slide corresponding to the particular numeral. Thus, besides having the numerals on each slide the operator also has the benefit of the numerals on the index finger to show him where to insert his stylus. The index finger 61 is mounted on a rod 62 (see also Fig. 2) and is adapted to be moved to the right or left. A spring actuated detent 64 fixed with respect to the index finger is adapted to cooperate with notches 65 across the upper part of the rod 62. There is one of these notches for each slide 52. A lever 66 pivoted on the index finger reaches under the detent spring 64*a* at one end and may be depressed at the other to lift the

detent out of the notches 65 so that the index finger may be readily moved toward the right in Fig. 2.

A cam edge 67 is provided on the index finger to be engaged by the stylus as it is moved downwardly with the slide. This will move the index finger one step to the left as each slide is set so that it will uncover the next slide 52 to be set. In this way, the operator sets the slide lying immediately to the right of the index finger and the index finger is automatically moved one step to the left when the slide is set. In camming the index finger to the left the stylus finally lodges in the lower portion of the notch 68. The index finger will thus be moved to the left until the upward projection 69 engages the stylus.

It is sometimes desirable to punch more than one hole in each column. For this purpose the slides 52 may be made thinner and more than one may be provided above each column of punches. I have shown other means, however, in the present instance, for effecting punching of a plurality of holes in a single column. As shown in Figs. 1 and 5, two setting pins 70 are slidably mounted between the supporting bars 53 for each column of punches 8. In Fig. 5, these pins are shown to the left and may be moved to the right into position above the desired punches. Suitable means may be provided to hold these pins in position so that they will not be accidentally moved. For this purpose, each of the pins 70 may be provided with a hole 71 as shown in Fig. 1 and a plate 72 shown in Fig. 13 may be provided to lock the pins in position.

The plate 72 has downwardly projecting V-pointed locking pins 73 corresponding to all of the positions to which the pins 70 may be moved as well as to the inoperative positions which they normally occupy. This plate may be placed in position above the pins 70 so that the pins 73 will lodge in the holes 71 to lock all of those pins 70 which have been set, in position, and to lock all of those that have not been set, in their inoperative positions.

Two positioning holes 74 are provided in the plate 72 to cooperate with slotted studs 75 carried by the frame of the machine. Latches 74*a* may be provided to cooperate with studs 75 to lock plate 72 in position. When none of the pins 70 are to be used a separate locking plate 76 also having latches 74*a* (Figs. 14 and 15) may be placed over the pins 70, the holes 77 cooperating with the studs 75. The flange 78 will reach downwardly over the edge of the pins 70 to prevent them from accidentally moving into position above the punches. Instead of using an index similar to finger 61 a plate 79 such as shown in Fig. 16 may be employed. This plate is provided with a downwardly reaching flange 80 adapted to lodge in a groove 81 (see Fig. 1) in the frame of the machine. The plate 79 is provided with notches 82 in its edges corresponding to the several punching positions. The operator may insert his stylus in one of the holes 71 in the setting pins 70 moving the slide to the approximate position and then move the plate 79 against the stylus so that it will lodge in the appropriate notch 82 and be accurately adjusted to proper position.

The punches 8 are cut on one side to provide shoulders 85, and bars 86 are provided to engage these shoulders. The bars are raised and lowered with the die plates 5, 6 to positively lower the punches to normal position. Springs 87 serve to lower the die plates.

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:

I claim:

1. In a record card punching machine, means for effecting punching representing numerals in record cards, means for successively changing locations of the punching to change the numbers represented thereby, and means for periodically restoring said changing means from an intermediate to predetermined position to effect a repetition of the operation thereof.

2. In a punching machine, a plurality of punches, means for causing a record card to be punched by said punches, means for successively changing the control of said punches to effect a progression in the numbering effected by the punches and means for causing said numbering to be repeated after a predetermined intermediate number has been punched.

3. In a punching machine, a plurality of punches, means for causing a record to be perforated by said punches, means for successively bringing different punches into operation to effect punching representing serial numbers in the records from fifty to one and means for causing a repetition of such numbering after the card bearing the numeral 1 has been punched.

4. In a machine of the class described, a plurality of rows of punches, means for causing record cards to be perforated by said punches, means associated with each row of punches for selectively rendering the punches operative to perforate a record, means associated with the selective means in one of said rows for controlling the operation of the selective means in the row of the next higher order, and additional means for controlling said selective means associated with said higher order.

5. In a machine of the class described, a plurality of rows of punches, means for causing a record to be perforated by said punches, means for controlling the operation of the punches in each row, means for shifting the control means associated with the units row of punches, means operated by the units control means for shifting the control means associated with the tens row of punches once for every ten shifting operations of said units control means and additional means for shifting the control means associated with the tens row of punches after the control means associated with the units row of punches has been shifted a lesser predetermined number of times.

6. In combination with a machine having punches for effecting punching representing progressive numbering of records, a plurality of carry devices associated with one order of said punches for controlling another order thereof, one of said carry devices being operative to effect carrying after a predetermined number of punching operations and the other being adapted to effect carrying after a predetermined number of carrying operations have been effected by said one of said devices.

7. In a machine for effecting progressive numbering, means for applying numeral designations in a plurality of orders, means for effecting a carry operation from a lower edge to a higher order

when the lower order applying means has operated a predetermined number of times and additional means for effecting a carry operation from a lower order to a higher order when the lower order applying means has operated a different predetermined number of times.

8. In a record card punching device, a plurality of punches, means for moving a record against the punches, means for selectively locking punches against displacement by the card to cause perforation of the card, said selective means comprising a slide having a projection adapted to be moved into position over one of the punches, said slide having a plurality of holes into which a stylus may be inserted for actuating the slide to set position.

9. In a card punching device, a plurality of rows of punches, a slide associated with each row and adapted to be moved with respect thereto to selectively render the punches operative, a reference index movable into cooperation with the several slides and indication markings on the slides adapted for reading in connection with said reference for indicating the setting of the slides.

10. In a card punching machine, a plurality of rows of punches, a slide associated with each of said rows and adapted to be set by a stylus to render certain of the punches operative, an index member movable with respect to the slides and provided with a cam surface adapted to be engaged by the setting stylus to move the member with respect to the slides.

11. In a punching machine, a plurality of rows of punches, a plurality of pegged rotors adapted to control the operation of said punches, means for turning said rotors to change the control thereof over the punches, said means including a ratchet wheel associated with one of said rotors for turning the same, a second ratchet wheel mounted near said first named ratchet, and a pawl device operating upon said ratchets to turn them, said second named ratchet having deep and shallow notches to permit the pawl device to actuate said first named ratchet during some of its operating strokes and to prevent the pawl device from actuating said first named ratchet during others of its operating strokes, said second named ratchet being larger than said first named ratchet and being mounted to rotate on an axis eccentric to the axis of said first named ratchet.

12. In a punching machine, a plurality of rows of punches, a plurality of pegged rotors adapted to control the operation of said punches, means for turning said rotors to change the control thereof over the punches, said means including a ratchet wheel associated with one of said rotors to turn the same, a second ratchet wheel associated with said first named ratchet, and a pawl device operating upon said ratchets to turn them, said second named ratchet having deep and shallow notches to permit the pawl device to actuate said first named ratchet during some of its operating strokes and to prevent the pawl device from actuating said first named ratchet during others of its operating strokes, said second named ratchet being provided with a greater number of notches than said first named ratchet and the axis of said second named ratchet being eccentric to the axis of said first named ratchet.

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