March 15, 1938. F. H. M. HART ET AL 2,110,862

PERFORATING MACHINE

Filed Dec. 19, 1935 6 Sheets-Sheet 1

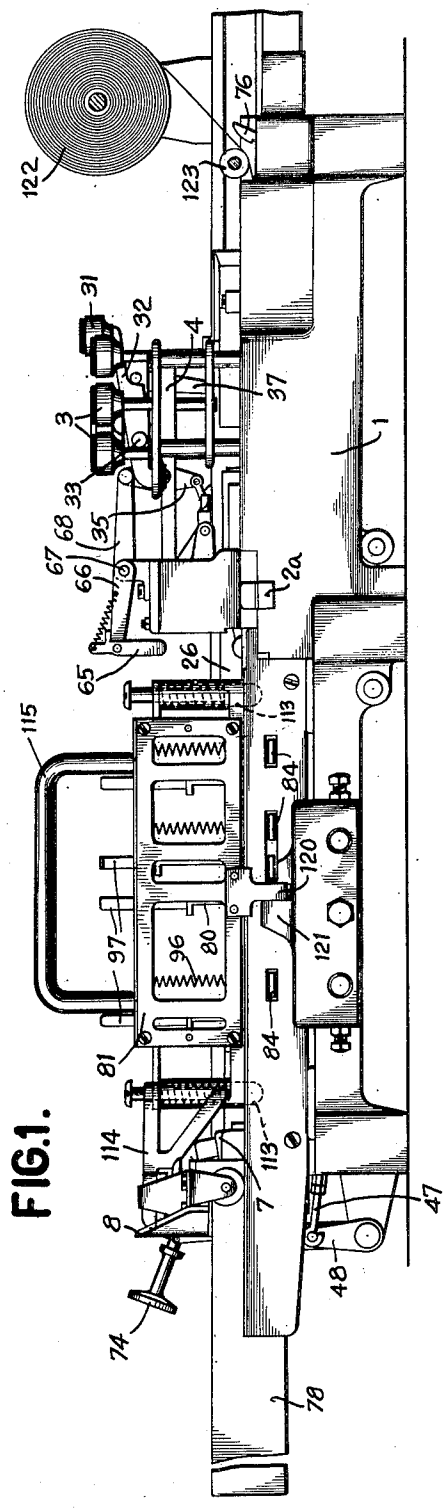


FIG.1.

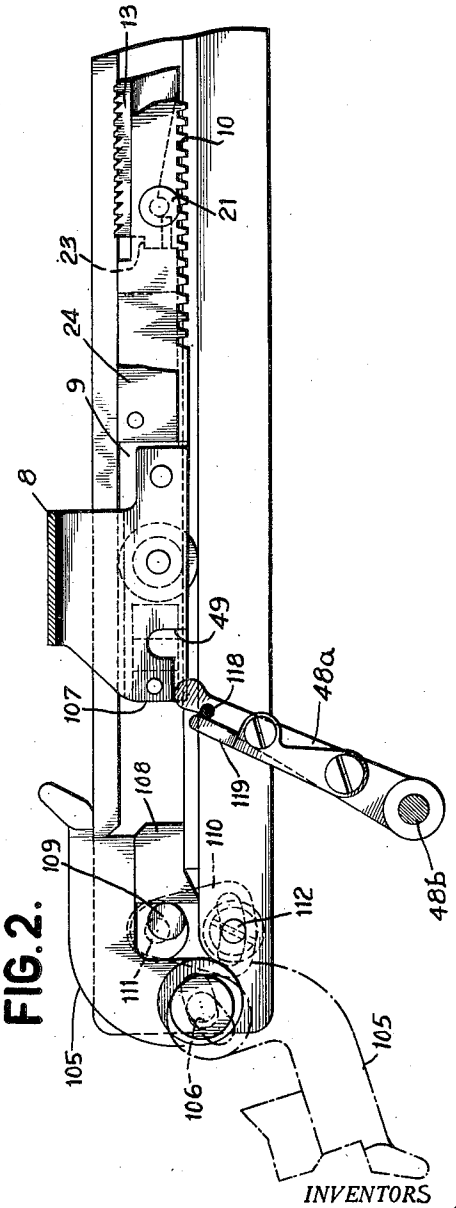


FIG.2.

INVENTORS

Frederick H. M. Hart

BY Clement Ebert

A. C. Mosby ATTORNEY

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PERFORATING MACHINE

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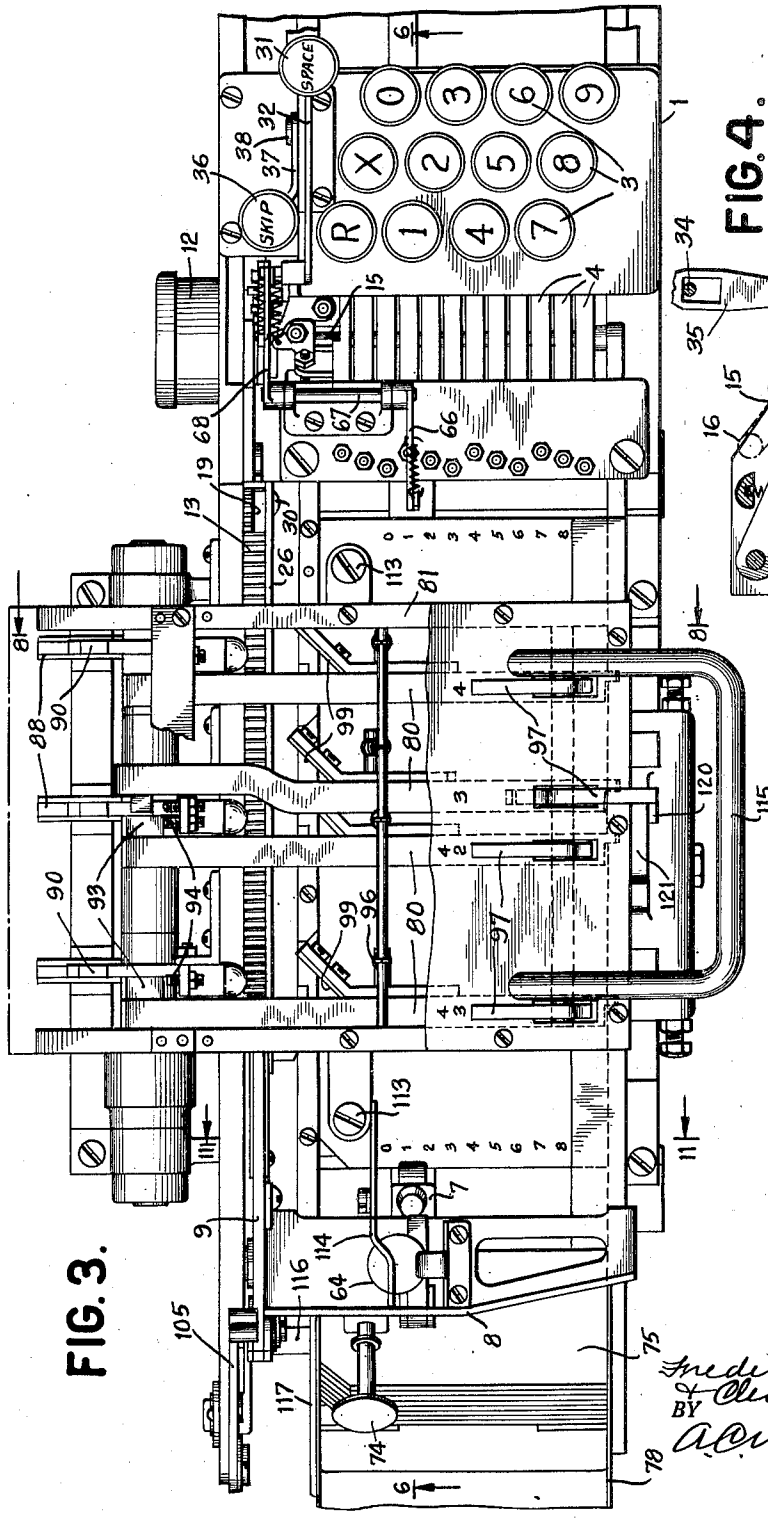


FIG. 3.

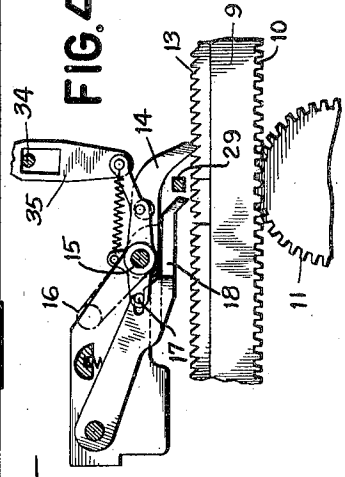


FIG. 4.

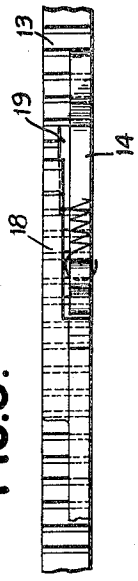


FIG. 5.

INVENTORS
Frederick H. M. Hart
& Clement Ehret
BY
A. Crosby
ATTORNEY

March 15, 1938. F. H. M. HART ET AL 2,110,862

PERFORATING MACHINE

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FIG.7.

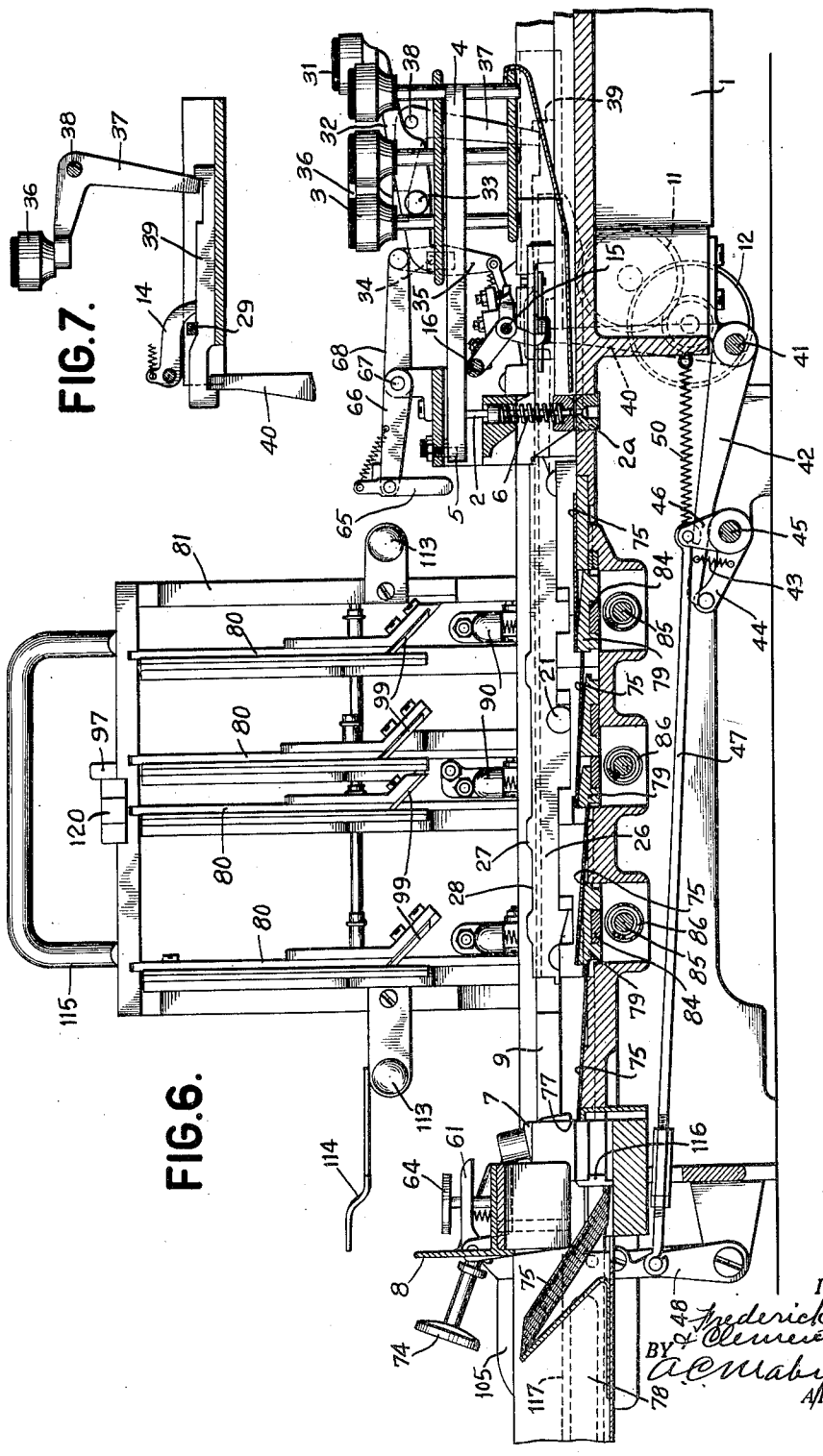


FIG.6.

INVENTORS
Frederick H. M. Hart
& Clement Elvet
BY A. C. Maby
ATTORNEY

March 15, 1938. F. H. M. HART ET AL 2,110,862

PERFORATING MACHINE

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FIG.8.

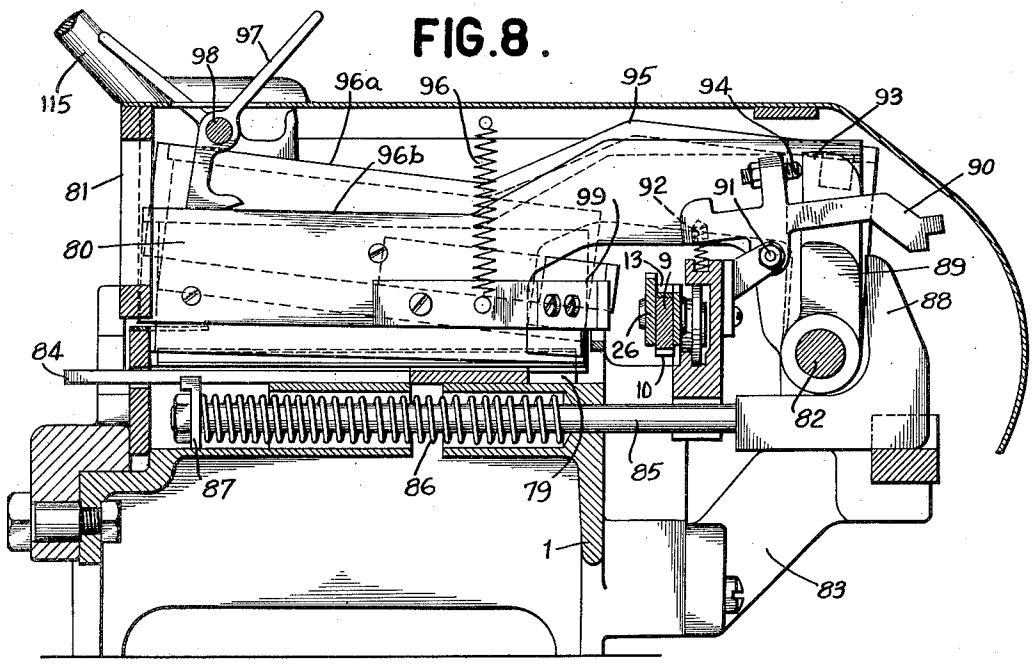


FIG.9.

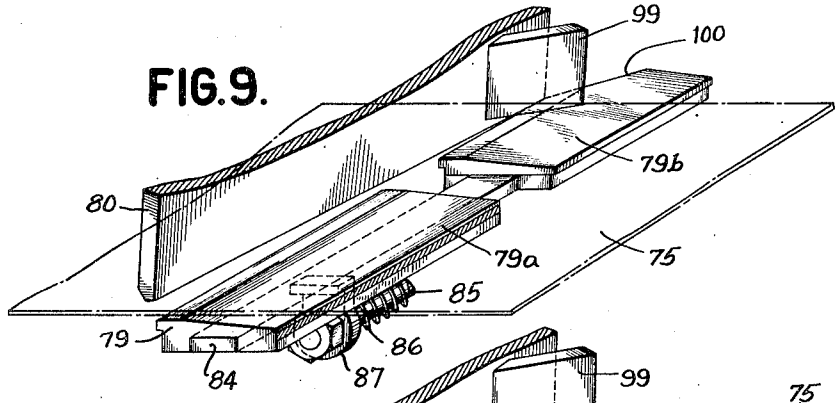
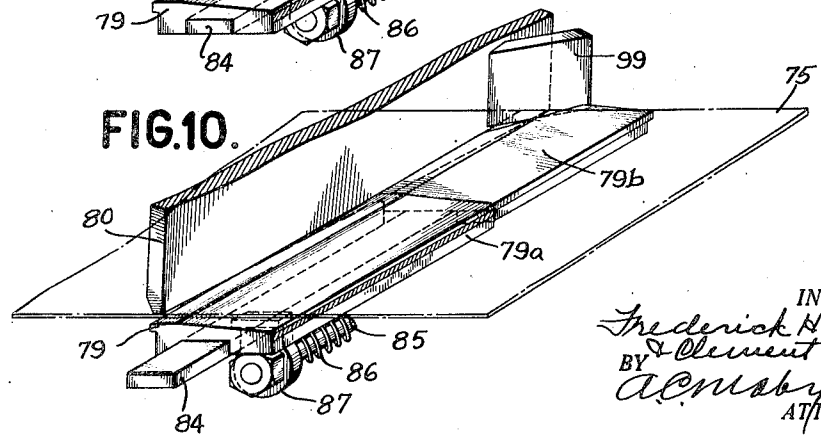


FIG.10.



INVENTORS
Frederick H. M. Hart
& Clement Elliott
BY
A. C. Mosby
ATTORNEY

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FIG.11.

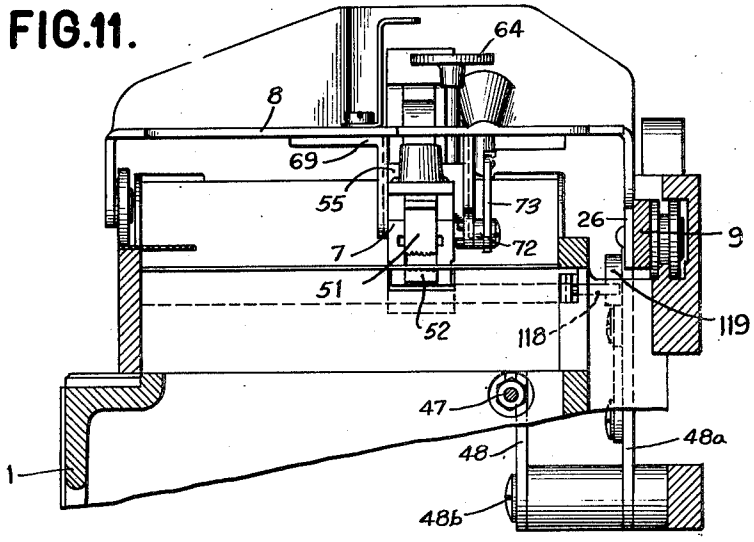


FIG.12.

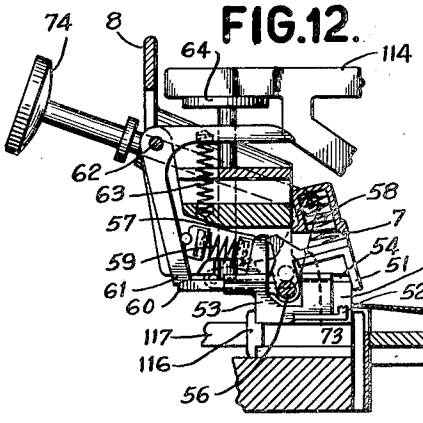


FIG.13.

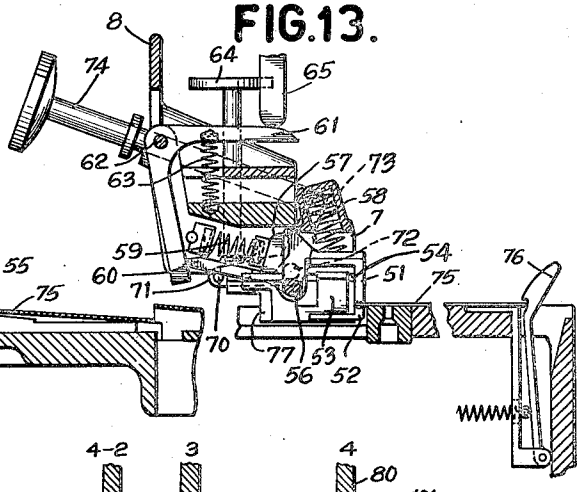
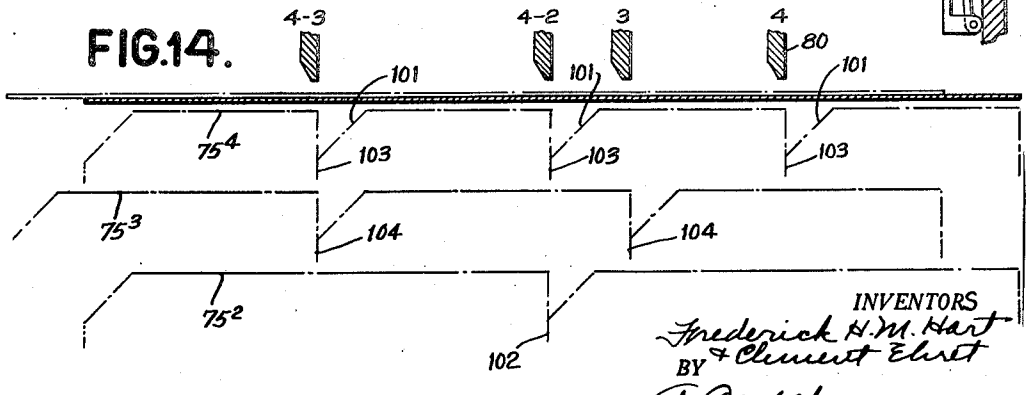


FIG.14.



INVENTORS
Frederick H. M. Hart
& Clement Ehret
BY
A. O. Maby ATTORNEY

March 15, 1938. F. H. M. HART ET AL 2,110,862

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FIG.15.

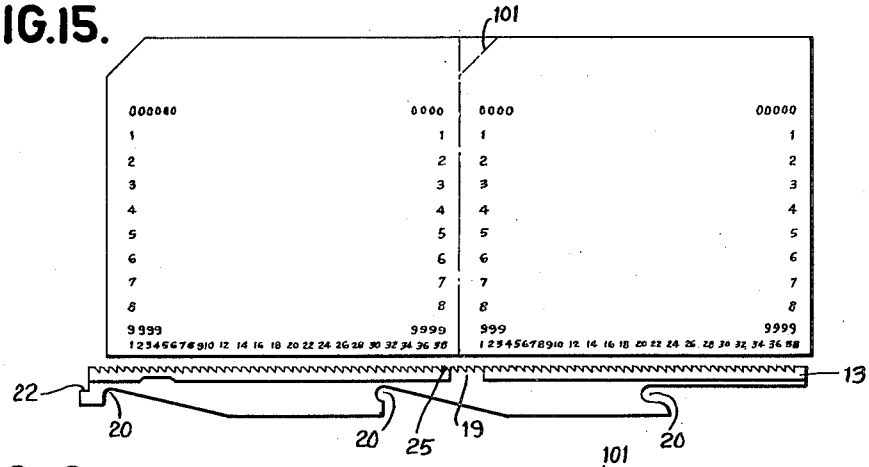


FIG.16.

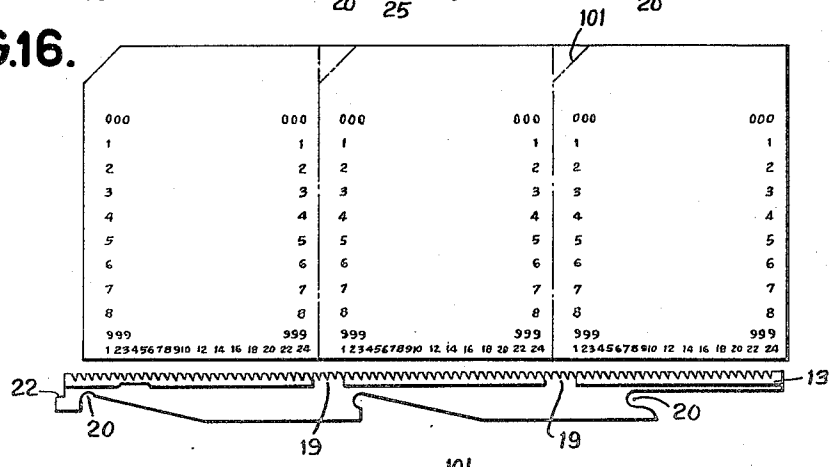
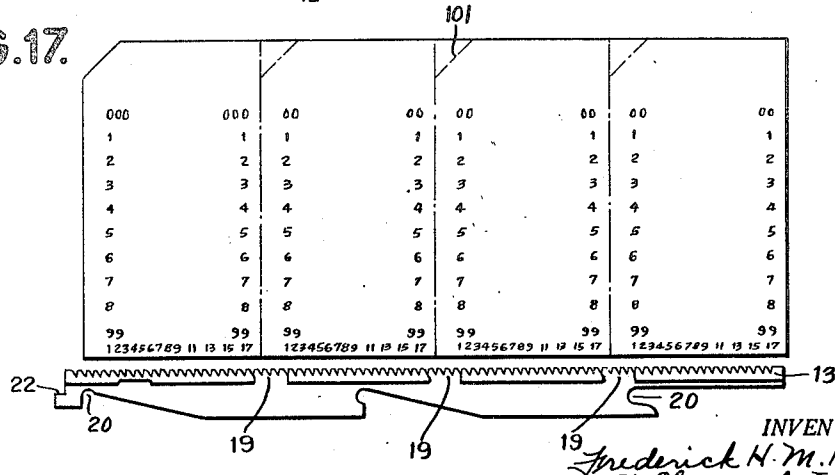


FIG.17.



INVENTORS
Frederick H. M. Hart
BY Clement Ehret
A. Crosby
ATTORNEY

Patented Mar. 15, 1938 2,110,862

UNITED STATES PATENT OFFICE

2,110,862

PERFORATING MACHINE

Frederick H. M. Hart, Poughkeepsie, and Clement Ehret, White Plains, N. Y., assignors to International Business Machines Corp., New York, N. Y., a corporation of New York

Application December 19, 1935, Serial No. 55,180

20 Claims. (Cl. 164—14)

This invention relates to perforating machines adapted to prepare perforated cards for use in the operation of calculating machines such as sorting and tabulating machines.

One object of the invention is to devise a machine of this type which will cut the cards into desired sizes on the completion of the punching of the data in the cards.

Another object is to devise a punch of this type in which cards of different sizes may be prepared in the same machine.

Another object is to devise means whereby a record card of a given length may be cut into several small cards and the perforations in each of these small cards made at a predetermined distance from an edge of the card.

Other objects will appear in the following description of the invention.

Referring to the drawings:

Fig. 1 is a front elevation of the punch with the left and right ends cut off;

Fig. 2 is a detail of the card carriage mechanism;

Fig. 3 is a plan view of the machine shown in Fig. 1 with the cover portion omitted to show the mechanisms thereunder;

Fig. 4 is a detail of the carriage escapement;

Fig. 5 is a top view of the escapement shown in Fig. 4;

Fig. 6 is a section taken on line 6—6 of Fig. 3 showing the card cutting knives in raised position;

Fig. 7 is a detail of a card carriage control mechanism for releasing the carriage;

Fig. 8 is a sectional detail taken on line 8—8 of Fig. 3;

Figs. 9 and 10 are detail perspective views of one of the cutting devices;

Fig. 11 is a sectional detail taken on line 11—11 of Fig. 3;

Figs. 12 and 13 are sectional details of a card gripper;

Fig. 14 is a diagrammatic view illustrating the manner in which a card of given size may be cut into several small cards of varying sizes;

Figs. 15, 16 and 17 illustrate the manner in which the machine produces perforated cards of different sizes.

In the drawings the base 1 of the machine is provided with a row or column of 12 punches 2, corresponding to one column of 12 perforation positions on a record card. The punches cooperate with punch dies 2a. The card is fed column by column under this row of punches and the operation of one of the keys 3 will depress a corresponding lever 4 pivoted at 5 and resting on the top of the particular punch 2. This depresses the punch, against the action of its spring 6, to punch a hole in one of the 12 positions in the column.

Card feed

The feeding of the card with respect to the punches is effected by a card gripper 7 mounted on a bracket 8 fixed to a rack bar 9 having gear teeth 10 along its lower edge as shown in Figs. 2 and 4. Teeth 10 mesh with a gear 11 operated by a spring drum 12. Movement of the rack 9 of the card carriage from the left to the right effects tensioning of the spring which thereafter tends to return the carriage to the left.

The escapement pawl mechanism of Fig. 4, cooperating with ratchet teeth 13 carried by the carriage rack 9, holds the card carriage in position until operated to release the carriage to escape a distance of one or more columns. The pawl 14 of the escapement, pivoted at 15, normally holds the carriage in position. When one of the keys 3 is operated to depress the bar 4, the latter, resting on a bail 16 reaching under all of the bars 4, will be rocked downwardly on its axis 15. This lifts pawl 14 out of the ratchet teeth 13. At the same moment a pin 17 rocks a holding pawl 18 into mesh with the ratchet teeth 13. As the key is released the pawl 14 reengages the teeth 13 and pawl 18 disengages and the carriage escapes a single column.

It is, of course, understood that the pawl 14 jumps forward slightly when it is lifted out of the rack so that when it moves back into the rack it reaches over the teeth which it had previously been holding and the carriage jumps to the left until the next tooth is stopped by the pawl. This escapement mechanism is well known in this art and need not be described in all of its details.

As viewed in Figs. 3 and 5, the stepping pawl 14 cooperates with one edge of the ratchet rack 13 and the holding pawl 18 with the other edge. Thus by cutting out part of several of the ratchet teeth as at 19, when this portion of the rack reaches the pawl 14 the carriage will skip a distance equal to the extent of the mutilated portion of the rack. As shown in Fig. 15, the rack has one mutilated portion 19 while the rack in Fig. 16 has two such mutilated portions and the rack in Fig. 17 has three mutilated portions. The rack 13 is detachably mounted on the carriage rack 9 so that differently cut racks may be attached depending upon the places in which the cards are to be cut. If a full length card is to be cut into two

smaller cards as in Fig. 15 then a rack having one mutilated portion 19 is placed in the machine. If the card is to be cut into three sections then the rack in Fig. 16 is placed in the machine, etc. These racks are provided with notches 20 adapted to fit over studs 21 having heads as shown in Fig. 2. A shoulder 22 (Fig. 15) is adapted to snap under a cooperating shoulder 23 on a flat spring plate 24 fixed to the carriage bar 9 to hold the rack rigidly mounted on the carriage.

When dividing a card of given dimension into various smaller sizes, it is necessary that the columns of perforations on each card shall be the proper distance from one edge of the card in order to cooperate correctly with the perforation sensing elements of sorting and tabulating machines. In the present instance, the perforations may occupy positions arbitrarily measured from the left edge of the card. For this reason, it may be necessary to make a correction in the increment of feeding between the last column on one card section and the first card column on the next section. In other words, the teeth in the rack 13 are equal to the distance between adjacent columns on a card. If the entire card of Fig. 15 is to be punched as one card then the teeth of rack 13 continue with equal spacing throughout the entire length of the bar. But where the card is to be split into two as in Fig. 15 the distance between the last column on one of the card sections and the first column on the following section is not equally divisible by the distance between two columns. The correction is made by increasing or decreasing the distance between two of the teeth as at 25, so that when the carriage comes to rest after skipping over the gap 19, the escapement rack will be stopped in position to present the first column on the second section of the card, in position under the punches so that the perforations will be made the same distance from the left edge of the second card as in the case of the first card. This correction may be made in each of the several racks at each of the mutilated portions 19 thereof.

In order to skip certain columns on a card, that is, on one of the various smaller cards, the skip cam bar 26 common to these machines may be employed. These skip bars are provided with raised sections 27 and depressed sections 28 along their upper edge (Fig. 6). A skip lifter bar 29 shown in Fig. 4 reaches out over the edge of the cam bar 26 which is mounted on the carriage 9 on studs 30 similar to the mounting of the escapement rack on the carriage. The skip lifter 29 is under the escapement pawl 14 and as the cam bar 26 moves step by step, when a raised portion 27 thereof reaches the skip lifter 29, if the X key is depressed it will move the lifter and the latter will be raised by the cam bar and raise the pawl 14 out of the escapement teeth 13 and the carriage will move freely until the raised portion 27 rides out from under the skip lifter 29, permitting the pawl 14 to reengage the escapement rack 13.

The carriage may be caused to escape a single column without punching, by depressing the space key 31. This key is carried by an arm 32 pivoted at 33 and connected at 34 to a link 35 adapted to rock the escapement pawls in the usual manner to effect the single column escapement (Figs. 4 and 6).

In order to release the carriage so that it may move freely the full distance to the left, a skip key 36 may be provided. This key is carried by an arm 37 pivoted at 38 and cooperating with a cam slide 39 resting under the skip lifter bar 29. Depression of the key raises the skip lifter and the pawl 14, and the parts remain in this position until the cam slide 39 is again restored to the left as viewed in Fig. 7. This permits the carriage to move the full distance to the left.

The restoration of slide 39 is effected through an arm 40 fixed on a rod 41 (Fig. 6) on which is also fixed an arm 42 connected by spring 43 to an arm 44 pivoted at 45 and fixed with respect to an arm 46 connected by a link 47 to an arm 48. Arm 48, (Fig. 6) is fixed with respect to arm 48a pivoted at 48b. Arm 48a reaches up into a path of a shoulder 49 on the carriage bar 9 (Fig. 2) so that as the carriage reaches the end of its travel to the left, it will rock the arm 48a, pulling the rod 47 of Fig. 6 to the left, rocking arm 44 counterclockwise and through spring 43 rocking arm 42 downwardly and arm 40 to the left, to restore the slide 39 to the position of Fig. 7. A spring 50 (Fig. 6) normally tends to rock arm 46 clockwise to hold the arm 48a in its normal positions.

Card gripper

The card gripper or clip which feeds the card to the left, is shown at 7 mounted on the bracket 8 which is fixed to the bar 9 to form the card carriage. This gripper is provided with upper and lower jaws 51, 52 (Figs. 12 and 13). The lower jaw 52 is fixed to a sliding block 53 slidable in groove 54 of the fixed block 55. The upper jaw 51 is pivoted at 56 to the block 56 and is adapted when raised, to engage an upward projecting portion 57 of the sliding block 53 so as to move the lower jaw 52 to the left as viewed in Figs. 12 and 13. A spring 58 tends to rock the upper jaw downwardly to closed position to grip the edge of a card. When this takes place, a spring 59 presses the projection 57 to the right and moves the lower jaw 52 into position with respect to the upper jaw and below the edge of the card.

Fixed with respect to the upper jaw 51 is a rearwardly projecting arm 60 adapted to be held in its lower position as in Fig. 12 by a latch 61. The latch 61 is pivoted at 62 and is provided with a compression spring 63 adapted to rock it into latching position. A key 64 reaches downwardly and engages the top of the projecting arm 60 and is adapted to press arm 60 to its lower position, thus opening the jaws of the gripper, and the latch 61 will latch the parts in open position.

When the carriage is moved to the right with the jaws in open position, the latch member 61 comes to rest under a finger 65 carried by an arm 66 pivoted at 67 and fixed with respect to an arm 68 connected at one end to link 35, which as we have seen is connected to the escapement mechanism. When any one of the punch keys is operated and operates the escapement mechanism, the finger 65 is rocked downwardly to depress the latch 61. This releases the jaws and permits them to close and grip the card so that when the carriage now escapes, it will take the card with it to effect column by column feeding. Operation of the skip key 31 which as we have seen lifts the link 35 to operate the escapement, will also effect closing of the jaws of the card gripper.

The block 55 of the gripper is mounted to slide

up and down in the plates 69 (Fig. 11) on bracket 8. A pin 70 (Fig. 13) carried by an arm 71 pivoted at 72 and fixed with respect to arm 73 (see also Fig. 11) is adapted when the arms 73—71 rock, to raise the clips in bracket 8. Arm 73 is connected to a key 74 carried by the bracket 8. The operator, in returning the carriage from the left to the right in the machine, presses the key 74. This first lifts the card gripper assembly above the surface of a card in the machine and as the operator moves the key to the right the entire carriage with the card gripper is moved in this direction.

When the carriage has been moved its full distance to the right the jaws of the card gripper will be in position to engage the left edge of card 75 which has been placed in the machine. The card is pressed by a spring-actuated stop 76 into engagement with the card gripper. As soon as one of the keys is depressed, it will rock the latch member 61, releasing the jaws so that they will close upon the card as in Fig. 13. When the card carriage reaches its position to the right and the key 74 is released to lower the grippers into position to grip the new card, the rear edge 77 of the gripper assembly will be in position to engage the right edge of the cards which have been cut and remain in the positions shown in Fig. 6. As the new card is now punched and the carriage steps to the left, the gripper will push the cut cards along with it so that when the carriage reaches the end of its travel to the left the cards will have been pushed into the stacker 78 as in Fig. 6.

A projection 116 (Fig. 3), connected to a slide 117 carried on the outside of the stacker, is adapted to stack the cards. A pin 118 (Fig. 2) reaches from the slide 117, into engagement with an arm 119 on arm 48a. When the gripper moves to the left it will engage the projection 116 near the end of its stroke and move it to the left, pushing the punched cards into stacked position. When the carriage is moved to the right, the movement of arm 48 carries the projection 116 with it.

Cutting the cards

The cutting of the cards is effected by means of cutting dies 79 carried by the base frame of the machine, working in cooperation with hinged knives 80 carried by a frame 81 hinged at 82 to a bracket 83 fixed to the base 1. Each cutting die is made up of two parts 79a, 79b. The part 79a of the die is fixed in the base of the machine and the part 79b is slidable therein, being provided with a guide tongue 84 sliding in a groove in the fixed part 79a.

Normally the parts are in the open position shown in Fig. 9 so that as the card carriage moves from the right to the left with a card which is being punched, the gripper travels through the space formed between the parts 79a and 79b of the cutting dies. After the carriage has reached its position at the left of the machine and the card is in position to be cut, the operation of the cutting knives causes the movable parts 79b of the cutting dies to be released so that they move into closed position as in Fig. 10. The part 79b is fixed to a rod 85 by means of a bracket 87 integral with the tongue 84. The rod 85 is slidable in the base of the machine and is provided with a compression spring 86 pressing against the bracket 87 at one end and against the frame of the machine at the other. The spring tends to move the rod with the part 79b to the left as viewed in Figs. 8 and 9 to move the part 79b to the closed position of Fig. 10. The right end of rod 85 is provided with an upwardly projecting arm 88 fixed thereto. Arm 88 is adapted to be actuated by a cam 89 fixed with respect to the rocking frame 81 so that when the latter is raised, the cam will move the member 88 to the right (Fig. 8) to move the die portion 79b to the open position of Fig. 9.

A latch 90 pivoted at 91 and actuated by a compression spring 92 will cooperate with the upper end of member 88 to hold the parts in open position. When the rocking frame 81 is lowered a projection 93 fixed thereto will engage a pin 94 in the latch 90 and rock the latter to release the member 88 so that the spring 86 will close up the cutting dies. The parts are so adjusted that this closing takes place before the cutting knives reach the cutting dies.

The cutting knives 80 are fixed to arms 95 pivoted at 82 so as to swing with the frame 81 when the latter is opened and closed. A spring 96 is associated with each cutting knife and tends to hold the latter in raised position 96a of Fig. 8 so that when the frame 81 is lowered, the knives will not cooperate with the dies to effect cutting of the card. Levers 97 pivoted at 98 are adapted, when rocked clockwise as viewed in Fig. 8, to lower the knives to the position 96b so that when the frame 81 is lowered the knives will cooperate with the dies to cut the card. Associated with each knife 80 is a corner cutting knife portion 99 adapted to cooperate with the oblique edge portion 100 of the die part 79b so as to cut off one corner of each of the cards as indicated at 101 in Figs. 14 to 17. As disclosed, there may be four cutting dies 79a—79b, and four cooperating cutting knives 80. The knives as well as the dies are spaced as shown in Fig. 14 so that if a full length card is to be cut into two parts, the knife designated 4—2 will be released for operation, by the setting of proper lever 97 of Fig. 8. When the frame is lowered this knife alone will cut the card 75^2 along the line 102. If the card is to be cut into four equal parts then three of the knives, designated 4—3, 4—2 and 4 will be set to operate and will cut the card 75^4 along the lines 103 as in Fig. 14. If the card is to be cut into three equal portions the knives designated 4—3 and 3 will be set to operate and the card carriage will be permitted to move slightly farther to the left so that the card 75^3 will be cut along the lines 104.

The setting of the carriage to cut the card into two or four portions on one hand, or into three portions on the other, is controlled by a stop member 105 (see Fig. 2) pivoted at 106 to the frame of the machine. When the stop is in the position of Fig. 2, the left end 107 of the carriage will strike the shoulder 108 of the stop 105. This sets the carriage in position to cut the card into two or four parts. When the stop 105 is rocked to the dotted line position of Fig. 2, the carriage is free to move until it engages the fixed stop stud 109 and will be in position to effect cutting of the card in three parts. The stop 109 is carried by a plate 110 pivoted at 111 to the frame of the machine and adapted to be rocked on its pivot so as to effect a fine adjustment in the setting of the stud 109 which is off center with respect to the pivot 111. The plate 110 cooperates with a setting screw 112 through a slot so that the plate may be moved to the proper position and fixed in such position by tightening of the screw. This sets the stop stud

109 in accurate position for the setting of the carriage to cut the card into three parts. It also accurately determines the position of the movable stop 105 to stop the carriage in position for the cutting of the card into two or four parts.

A pair of spring pressed fingers 113 may be carried by the rocking frame 81 to press upon the card as the frame is lowered for cutting, to hold the card firmly in position while it is being cut.

An arm 114 fixed to the rocking frame 81 is adapted to reach over the top of key 64 when the rocking frame is lowered to effect cutting. This depresses the key 64 and effects the opening of the jaws of the card gripper so that after the card has been cut and the rocking frame is raised out of position and the operator presses key 74 to move the carriage to the right, the gripping jaws will have released the card so that the gripper may now be raised above the surface of the card to move freely over the card when the carriage is moved to the right.

A handle 115 is provided on the frame 81 so that the latter may be readily manipulated.

A projection 120 on the frame 81 may be provided to cooperate with a shoulder 121 on the base of the machine, to prevent twisting of the frame 81 while the card is being cut.

As shown in Fig. 1, a roll 122 of stock may be provided to feed the card stock to the machine, instead of using individual standard size cards to be cut into smaller cards. A roller 123 may press lightly on the stock to hold it in place without interfering with feeding.

It will be understood that cards may be cut into other lengths than those shown in Figs. 15, 16 and 17. For instance, the card of Fig. 16 may be cut in one place instead of two, to produce one card a third of the standard length and one of two thirds standard length. Or, if the stock is being fed from a continuous strip, all cards may be cut two thirds standard length. In like manner, the card of Fig. 17 may be differently cut or cards of varying lengths produced from a reel.

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

What is claimed is:

1. In a punching machine, a plurality of punches, keys for selectively operating the punches to perforate a record card, a plurality of card cutters, feeding means for feeding a card in response to the operation of the keys and for locating the card in predetermined position with respect to the cutters so that the card may be cut into a plurality of smaller cards after being perforated.

2. In a punching machine, a plurality of punches, keys for selectively operating the punches, feeding means for feeding a card with respect to the punches, card cutters for cutting the card, and means for moving the cutters out of the path of the feeding means.

3. In a punching machine, means for punching a record card, a cutting device comprising a die and a cooperating blade, said die being normally out of operative position and means responsive to operation of the blade for cutting to cause the die to move into operative position.

4. In a punching machine, a plurality of punches for punching a record card, a plurality of cutting devices including cutting dies and cooperating blades, said dies being normally in inoperative position, means for operating the blades to effect cutting of a card, and means responsive to operation of the blades for causing the dies to move to operative position.

5. In a punching machine, a plurality of punches, keys for operating the punches, card feeding means controlled by said keys, a plurality of cutting devices positioned to receive a card from said feeding means, means for selecting certain of said devices for cutting operation, and means for operating said devices to cut the card into a plurality of smaller cards.

6. In a punching machine, a row of punches, keys for selectively operating the punches to punch a record card, feeding means adapted to feed the card being punched column by column in response to operation of the punches, means for causing skipping by the feeding means to omit punching of a portion of the card, and means for cutting the card through such omitted portion.

7. In a record card punching machine, punches, keys for selectively operating the punches, means controlled by the operation of the punches for feeding a card equal increments through the machine to effect column by column punching, means for causing skipping of the card at a predetermined position between the columns of punchings a distance unequally divisible by such increment, and means for cutting the card through the skipped portion to form a plurality of cards.

8. In a punching machine, punches, keys for selectively operating the punches, means for feeding a record card with respect to the punches, means for cutting the card into smaller cards after punching, and means associated with said feeding means for removing the cut portions from the machine.

9. In a punching machine, punches, keys for selectively operating the punches, means for feeding a card with respect to said punches, means for cutting the card into a plurality of smaller cards, and means associated with the feeding means for stacking the cut cards.

10. In a punching machine, punches, keys for selectively operating the punches to punch the card, means for feeding the card with respect to the punches, means for cutting a card into several smaller cards after punching, means for lifting the feeding means above the card and for restoring the same over the top of the card, said feeding means being adapted to push the cut cards out of the machine when feeding the next card being punched.

11. In a punching machine, punches, keys for selectively operating the punches to punch a card, means for feeding the card with respect to the punches, cutting devices for cutting the card fed from the punches, and means for moving the cutting devices out of the path of the feeding means.

12. In a record card making machine, a cutting blade for cutting the cards, a plurality of separable die sections adapted to cooperate with the blade in cutting, and means for moving the die sections together to form a continuous cutting edge to cooperate with the blade.

13. In a machine for perforating accounting and statistical record cards, punching mechanism including means for selectively operating the punching mechanism to punch data, a card

carrier, means controlled by operation of the punching mechanism to cause a step-by-step relative movement between the card carrier and punching mechanism to punch data in successive columns of the cards, a cutting knife located on one side of the card, a pair of separable die elements co-operating with said knife on the opposite side of the card to the knife, one of said die elements being fixed and the other movable toward the fixed die element, and means operable on the completion of punching operations for first moving the movable die element toward the fixed die element and thereafter moving the knife toward both dies to cut the card into two parts.

14. In a machine for punch accounting and statistical record cards, punching mechanism including a row of punches and means to selectively operate the punches, a card carriage, a card gripping device on the carriage for gripping the card, means controlled by operation of the punching mechanism for feeding the carriage one step at a time whereby to move the card past the row of punches as successive holes are punched in the card columns, a pair of longitudinally aligned die elements one of which is fixed and the other movable longitudinally toward the other said die element extending transversely of one face of the card and separated an extent sufficient to permit the card gripping device to pass between the confronting ends of the die elements, a cutting knife located on the opposite side of the card to the die elements, means to operate the knife, and means to automatically move the movable die toward the fixed die when said knife is operated to cut a card.

15. In a machine for punching accounting and statistical record cards, punching mechanism including punch selecting and operating mechanism, means to guide a card past the punching mechanism, a card carriage, a card gripping device mounted on the carriage, a card cutting device, releasable means operated by said device to disengage the gripping device, and means associated with the punching mechanism for releasing the releasable means when the carriage is in a predetermined position.

16. In a machine for punching accounting and statistical record cards, punching mechanism with means to selectively operate the punching mechanism, a card carriage, a pair of card gripper elements, mounted on said carriage, one of said elements being movable with respect to the other to grip a card, means to move the movable element to grip a card in co-operation with the other element, means to release the card gripper elements from engagement with the card, means to hold the gripper elements in disengaged position, a cutting device for cutting the card into two or more parts and having means to operate the releasing means when the carriage is in a predetermined position, and means operated by the punching mechanism for releasing the holding means when the carriage is in a different predetermined position.

17. In a machine for perforating accounting and statistical record cards, perforating mechanism, a card carriage, a card gripper device mounted on the carriage, a card cutting device, means operated by the card cutting device for disengaging the card gripper device from a card, means for moving the card carriage to a position to commence punching operations, means operated by the moving means for holding the gripper device out of the path of the card while the carriage is being moved to the position where punching operations commence, and means whereby the initial operation of the punching mechanism causes the gripping device to engage a card in position to commence punching operations.

18. In a machine for punching accounting and statistical record cards, card cutting mechanism, punching mechanism with means to selectively control the operation of the punching mechanism, means to feed a card to the punching mechanism in direct response to an operation of the punching mechanism itself and adapted to locate the card in predetermined position with respect to the cutting mechanism whereby a card may be cut into smaller cards of predetermined sizes after punching operations on the card are completed.

19. In a machine for punching accounting and statistical record cards, punching mechanism with means to selectively control the operation of said mechanism to record data in the cards, means to feed cards with respect to the perforating mechanism including a card gripper device, co-operating card cutting elements located to one side of the path of movement of the gripper device, and means to move both cutting elements into the path of the gripper device to cut a card held thereby.

20. In a machine for punching accounting and statistical record cards, punching mechanism with means to selectively operate the punching mechanism to record data in the cards, and card cutting mechanism for cutting each card into a plurality of smaller cards after said card has been punched, said cutting mechanism including a series of pairs of co-operating cutter elements, selectively operable means for moving one cutter element of each pair into an operative position, and means to operate the cutter elements to cut the card.

FREDERICK H. M. HART.
CLEMENT EHRET.