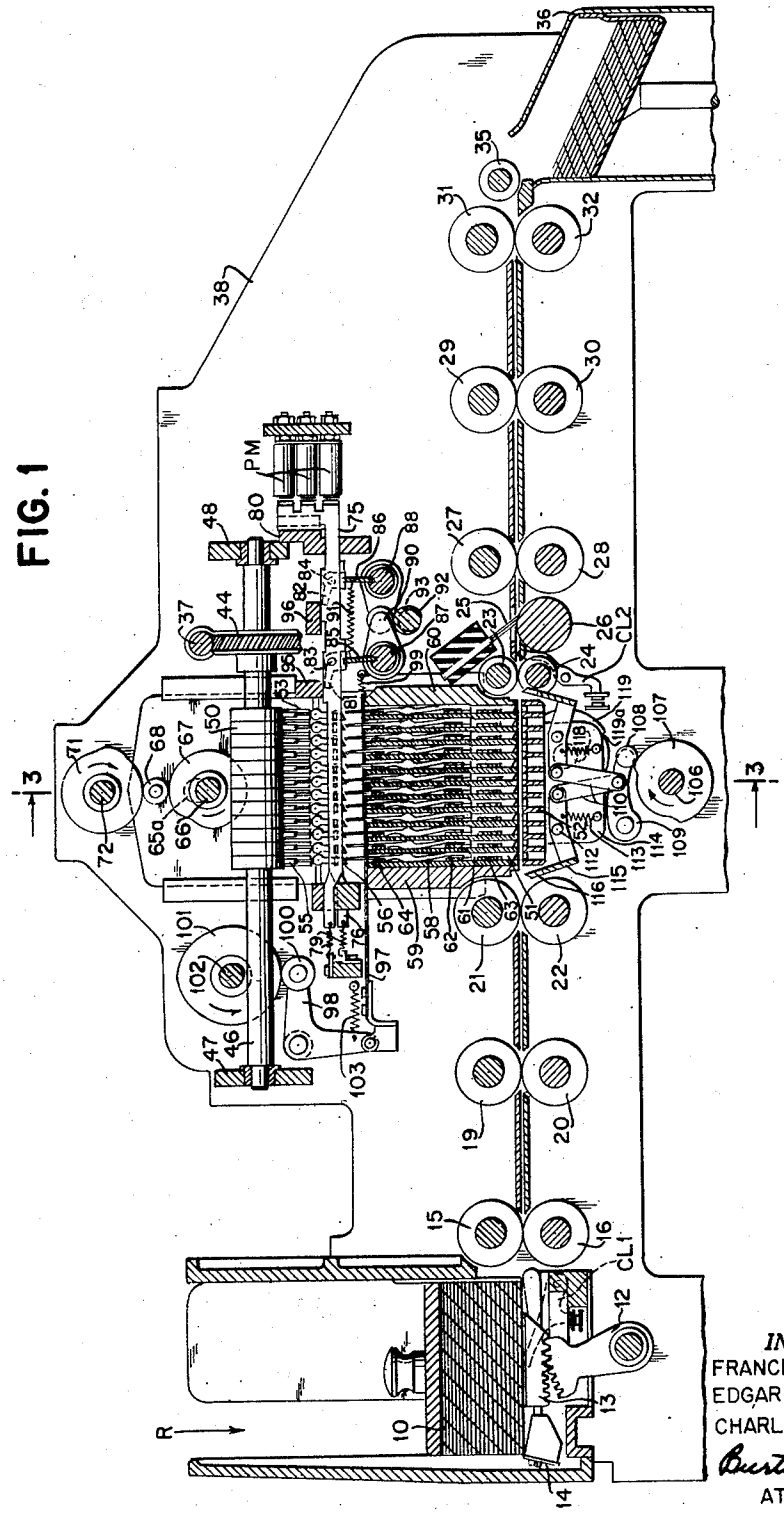
July 23, 1957 F. E. HAMILTON ET AL 2,800,182

PERFORATING MACHINE

Filed Nov. 18, 1954 5 Sheets-Sheet 1

FIG. 1



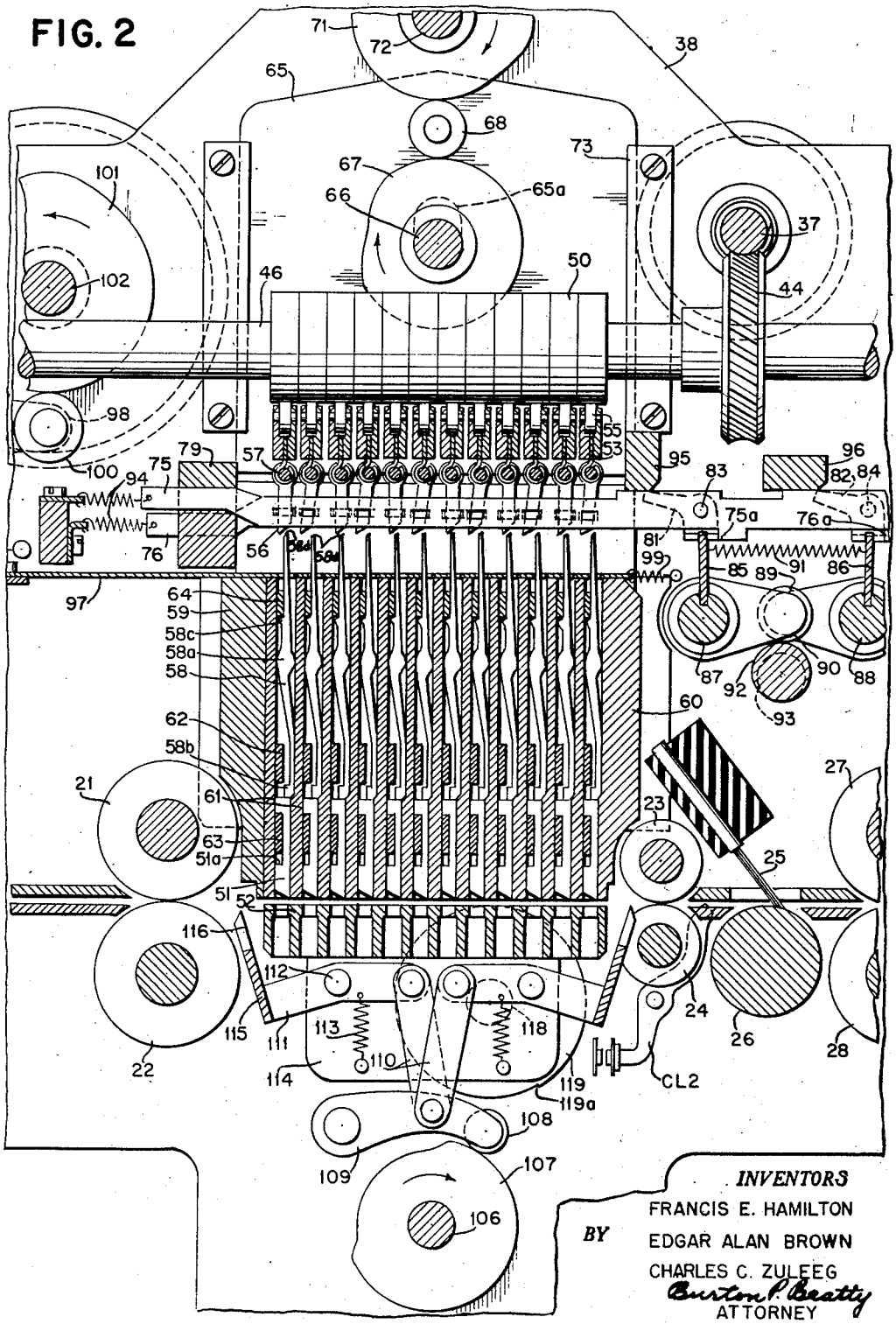
INVENTORS
FRANCIS E. HAMILTON
EDGAR ALAN BROWN
CHARLES C. ZULEEG
Burton P. Beatty
ATTORNEY

July 23, 1957 F. E. HAMILTON ET AL 2,800,182

PERFORATING MACHINE

Filed Nov. 18, 1954 5 Sheets-Sheet 2

FIG. 2



INVENTORS

FRANCIS E. HAMILTON

EDGAR ALAN BROWN

CHARLES C. ZULEEG

BY Burton P. Beatty

ATTORNEY

July 23, 1957 F. E. HAMILTON ET AL 2,800,182

PERFORATING MACHINE

Filed Nov. 18, 1954 5 Sheets-Sheet 3

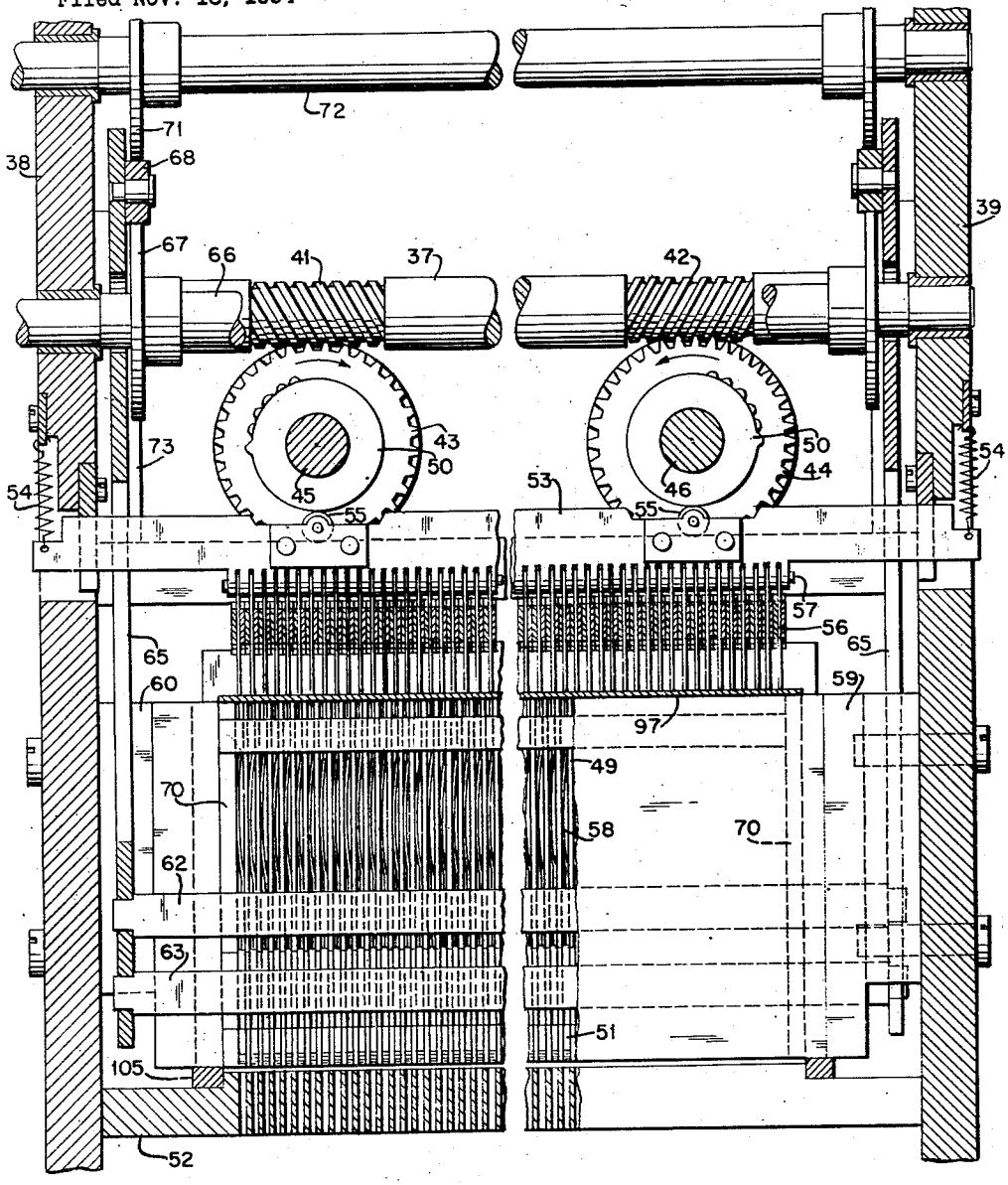


FIG. 3

INVENTORS
FRANCIS E. HAMILTON
BY EDGAR ALAN BROWN
CHARLES C. ZULEEG
Burton P. Beatty
ATTORNEY

July 23, 1957 F. E. HAMILTON ET AL 2,800,182

PERFORATING MACHINE

Filed Nov. 18, 1954 5 Sheets-Sheet 4

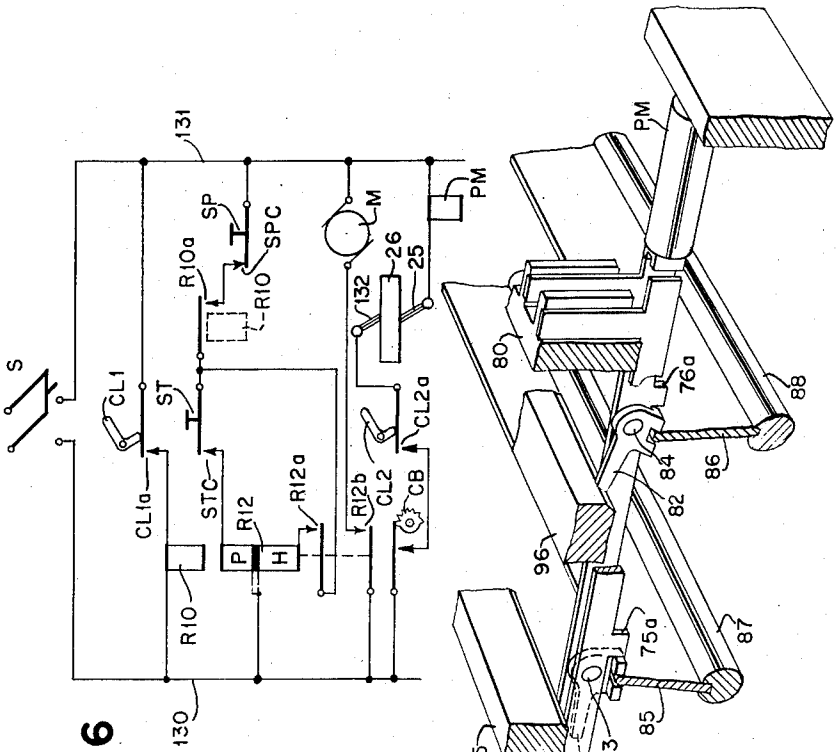


FIG. 6

FIG. 4

INVENTORS
FRANCIS E. HAMILTON
BY EDGAR ALAN BROWN
CHARLES C. ZULEEG
Burton P. Beatty
ATTORNEY

July 23, 1957 F. E. HAMILTON ET AL 2,800,182

PERFORATING MACHINE

Filed Nov. 18, 1954 5 Sheets-Sheet 5

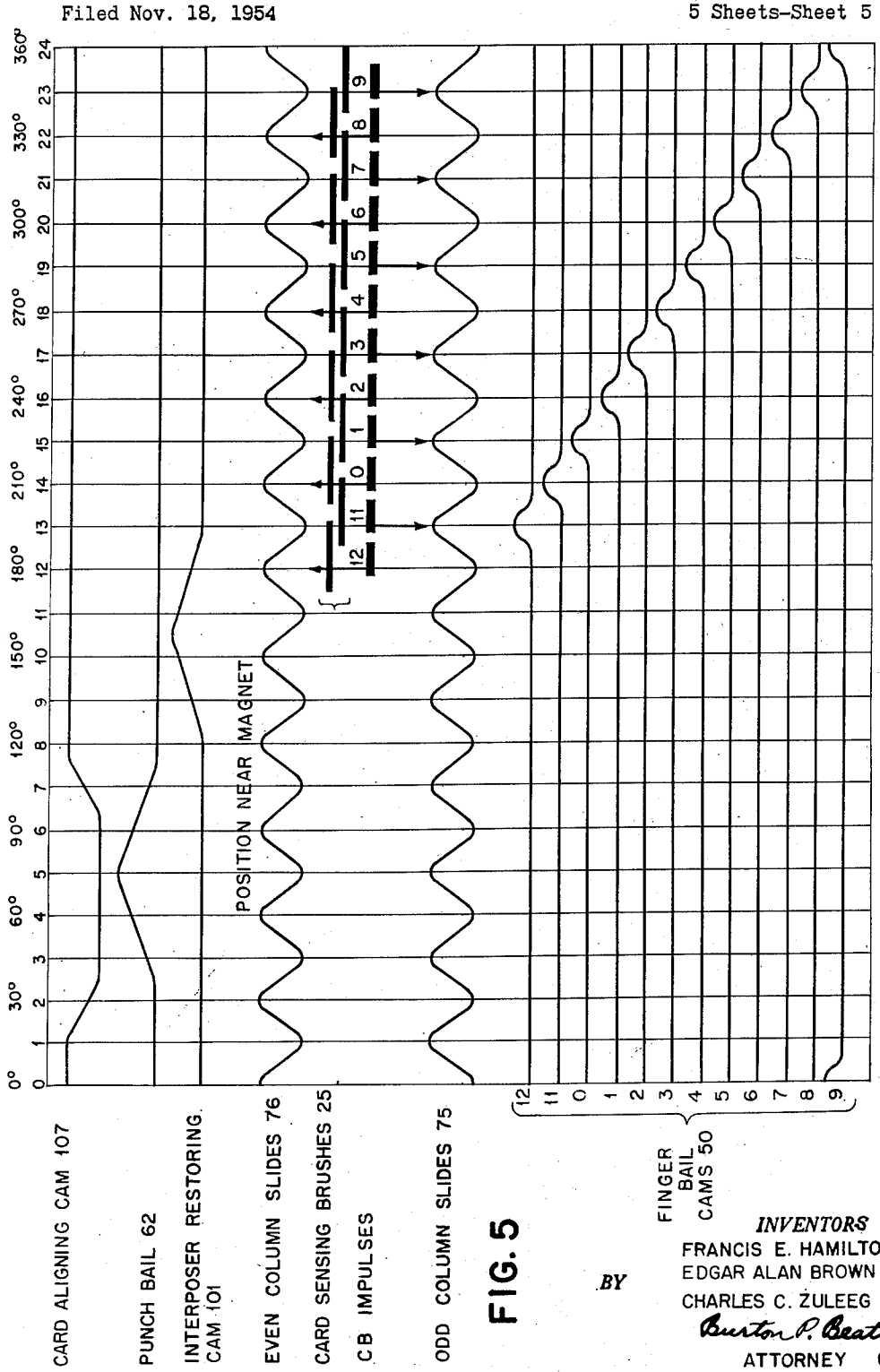


FIG. 5

INVENTORS
FRANCIS E. HAMILTON
EDGAR ALAN BROWN
CHARLES C. ZULEEG

BY Burton P. Beatty
ATTORNEY

United States Patent Office 2,800,182 Patented July 23, 1957

2,800,182

PERFORATING MACHINE

Francis E. Hamilton, Binghamton, Charles C. Zuleeg, Vestal, and Edgar A. Brown, Owego, N. Y., assignors to International Business Machines Corporation, New York, N. Y., a corporation of New York

Application November 18, 1954, Serial No. 469,806

12 Claims. (Cl. 164—115)

This invention relates to an improvement in machines for perforating record cards and more particularly to a novel mechanism for setting up the punches for the perforating operation.

The punching operation is accomplished by first punching a single record card by the usual key operated hand punch, and then placing the card in a machine of the type disclosed herein which will duplicate the pattern or master card in any desired quantity, punching the cards one at a time until the predetermined number has been punched. All holes are punched in each card at a single operation by a selected plurality of punches. This is known as a gang punching operation.

The principal object of the present invention is to provide a novel mechanism for setting up the complete data to be punched on a record card for subsequently punching all selected perforations at one time in the record.

An object of this invention is to provide an improved machine for performing punching operations in which the punching is performed at a high rate of speed.

Another object is to provide a mechanism whereby a single control means sets up the punches sequentially in any one or more of the index point positions in a column of a record.

A further object of the invention is to provide a punching mechanism whereby the setting up of the punches by a single control means is accomplished at a high rate of speed, though the setting up devices actually operate at only one-half this speed.

Other objects of the invention will be pointed out in the following description and claims and illustrated in the accompanying drawings, which disclose, by way of examples, the principle of the invention and the best mode, which has been contemplated, of applying that principle.

In the drawings:

Fig. 1 is a side sectional elevation view of the machine showing the card feeding, sensing and punching devices.

Fig. 2 is an enlarged detail view of the punch set-up mechanism showing one of the slides in an actuated position.

Fig. 3 is a sectional view taken along lines 3—3 of Fig. 1 with parts broken away to show the forward supports for the punching devices.

Fig. 4 is a perspective view showing the details of the punch set-up mechanism.

Fig. 5 is a timing diagram which can be followed to understand the operations of various mechanical and electrical devices shown herein.

Fig. 6 is an electrical wiring diagram of the preferred form of the invention.

Referring to Fig. 1, it is seen that a stack of blank record cards designated 10 are contained in a hopper R. These cards are the well known IBM cards having eighty columns of twelve punching positions and are fed from the hopper by means of an oscillating arm 12 and a reciprocating slide 13 carrying a picker 14, to a pair of feed rollers 15, 16. From rollers 15, 16 the cards are fed by two sets of rollers 19, 20 and 21, 22 to the punching station comprising twelve rows of punches 51 and a die plate 52.

The perforated cards are carried from the punching station by a pair of feed rollers 23, 24 which convey the punched card past a sensing station comprising brushes 25 and a contact roll 26. These brushes are known as the punch set-up brushes whose purpose will be later described. After leaving the sensing station, the card is carried by three sets of feed rollers designated 27, 28, and 29, 30, and 31, 32 and a guide roller 35 to a discharge hopper 36. The spacing between the sets of feed rollers is such that a card is positioned beneath the punches and punched before the following card enters the punching station. This is in accordance with standard practice to eliminate any possibility of a card jam. In order for each record card to be punched with the same information, a pattern card must lead the blank cards through the machine. When the first pattern card has reached the punch brushes 25, the blank card following it is entering the punching station. Perforations in the pattern card are read at the sensing station by brushes 25 and the impulses are transmitted to the punch magnets designated PM. This results in the setting up of the punches for the punching of the first blank card.

On the next cycle, the punched card is advanced from the punching station to the punch set-up brushes 25 where it, in turn, is read and serves as the pattern card for the following blank card. Thus, every card passing through the machine serves in its turn as the pattern card for the card directly behind it.

A punch magnet PM is provided for each card column and as the pattern card passes brushes 25, circuits are completed through the perforations to energize the magnets PM. The magnets control the setting up of the punches in the corresponding index point positions of the blank card at the punching station.

The driving connections for the card feeding mechanism, feed roller shafts and various cam shafts are not shown herein, but it is understood that these shafts are suitably connected to be constantly driven from a motor M shown diagrammatically in Fig. 6 to perform the machine functions in accordance with the machine timing shown in the timing diagram of Fig. 5.

Referring now to Figs. 2 and 3, a shaft 37 is mounted for rotation in machine side frames 38 and 39 and driven through a pulley 40 by suitable belt connections with the motor M. Shaft 37 has a pair of right angle worm gears 41 and 42 which are in mesh with worm wheels 43 and 44, fastened to shafts 45 and 46 respectively. These shafts are rotatably mounted in plates 47 and 48 (Fig. 1) which extend between the side frames 38 and 39. Each shaft 45 and 46 is provided with a series of 12 punch operating cams designated 50 generally, which correspond to the 12 index point positions on the record cards. The manner in which these cams cause a punch 51 to be actuated in the punching operation will be explained later.

In the following description of the punch set up mechanism, only one card column will be considered, it being understood that the machine is equipped with identical parts for each of the eighty columns.

A bail 53 (Figs. 3, 4) is provided for each index position and is yieldably mounted on the side frames 38 and 39 by means of a pair of coil springs 54. Each bail has a set of rollers 55 which are held against the surface of cooperating cams 50 carried by shafts 45 and 46 under pressure of the springs 54. A finger 56 is carried by each bail for each column position and is pivotally mounted on a rod 57, the finger being adapted to set up an interposer 58 for the ensuing punching operation.

Referring again to Figs. 2 and 3, a support frame is provided to carry the punch interposers 58 which are

moved into alignment with a related punch **51** for setting up the punch to effect punching during the punching operation. Cross bars **59** and **60** are firmly secured between the machine side frames and a pair of side plates **70** is fastened between the cross bars, one near each side frame. Each side plate **70** is slotted at intervals to provide grooves for receiving a plurality of plates **61** which forms channels for guiding the interposers **58**. Each channel is provided with a series of interposers, one for each card column. A row of punch interposers **58** is thus formed for each card column, there being an interposer for each index point position on the card. A series of vertical inserts **49** is provided in each channel, one insert being positioned between each interposer **58**. Each interposer is bowed (Fig. 3) and frictionally engages the sides of its adjacent inserts. In order to move an interposer vertically in the channel, a force must be exerted upon it to overcome the force of friction between it and the cooperating inserts. In addition each interposer has an enlarged portion **58***a* which acts as a fulcrum about which the interposer can be turned and a flange **58***b* at its lower end which rests on the top of a related punch **51**.

The punches **51** (Fig. 2) are each associated with an interposer **58** and are slidably arranged in the guide channels beneath their related interposers. A punch actuating bail **62** extends through each channel above the punches. This bail moves the selected punches downwardly on a punching operation, when the lower end flange **58***b* of the related interposers have been moved under the bail in a manner explained hereinafter. Each punch is provided with a notch **51***a* which receives a bail **63**. This bail serves as a positive restoring means for the punches. A stop bar **64** also extends through each channel and is secured to the channel plate **61** to cooperate with a projection **58***c* on each interposer **58** for limiting its upward vertical movement on the restoring operation of the cycle. Bails **62** and **63** are connected to a pair of supporting plates **65** which are mounted for vertical movement in a pair of channel members **73** secured to the machine side frames **38** and **39**. These interconnected bails form in effect, one integral structure which eliminates the possibility of a jam between them when the machine is in operation.

Each plate **65** is provided with a clearance slot **65***a* through which a rotatably mounted shaft **66** extends. Secured on shaft **66** is a pair of cams **67** which are engaged by rollers **68** carried by the plates **65**. The rollers **68** are also engaged by a pair of complementary cams **71** which are fastened on a shaft **72** extending between the machine side frames. Shafts **66** and **72** are constantly driven through a suitable connection from the motor M. These cams positively reciprocate the plates **65** vertically to cause actuation and restoration of the selected punches **51** through bails **63** and **62** respectively. In Fig. 5 it is seen that the bail **62** causes punching to occur at approximately 75° of the cycle from the setting of the punches which was made during the last half of the preceding cycle.

The magnet PM for each column (Fig. 1) controls the setting up of an interposer **58** in a selected index position through a duo of slides designated **75** and **76**. The fingers **56** in the even numbered index point positions 12, 0, 2, 4, 6 and 8 of a column extend downwardly into a space between related lugs **77** (Fig. 4) which project outwardly from the side of slide **76**. The odd numbered fingers 11, 1, 3, 5, 7 and 9 extend downwardly between similar lugs on slide **75**. These slides are supported for reciprocation in bearing blocks **79** and **80** and are provided with keeper members **81** and **82** (Fig. 2) pivotally mounted thereto at **83** and **84** respectively. These keepers are adapted to engage a pair of lugs **75***a* and **76***a* extending from the underside of slides **75** and **76** respectively. These lugs limit the counterclockwise movement of the keepers and enable the keepers to push the related slide to the right when they are urged counterclockwise. A notch in the under surface of each keeper member **81** and **82** receives a bail **85** and **86** respectively. These bails are keyed into shafts **87** and **88** respectively which are mounted for rotation in the machine side frames. A cam follower **89** having a roller **90** is secured to each shaft and a spring **91** extends between bails **85** and **86** to press the rollers **90** against the surface of an eccentric **92** on a constantly rotating shaft **93** which is mounted in the machine side frames. The slides **75** and **76** are maintained under tension by pressure of springs **94**. The eccentric **93** is so formed as to cause the bails **85** and **86** to operate 180° out of phase. The slides are in turn moved by their respective bails to oscillate at 180° out of phase as shown in the chart of Fig. 5.

As the eccentric **93** rotates, the odd and even slides are moved alternately against the pole face of the related magnet PM, and if the magnet is not energized, the slides will be moved away from the magnet by the oscillating bails. In the instance where the magnet PM is energized during the time that one end of a slide is moved up to its pole face, the slide is held against movement by the keeper action as explained hereinafter. The fingers **56** (Fig. 2) are moved downwardly by the cams **50**, as previously explained, which are timed to move the finger in each index position downwardly toward the related interposer **58** during the reading of the corresponding index position by the sensing brushes **25**, as shown in Fig. 5. The finger travels downwardly within the restriction of the lugs **77** for engagement with the interposer. When a perforation is not sensed by the brushes **25** in an index position, the finger is deflected by its oscillating slide to push the finger **56** out of line with the interposer **58**. As the finger is restored under pressure of springs **54** (Fig. 3), the slide returns it to a position in line with the interposer.

When a perforation is sensed by the brushes **25**, the magnet PM is momentarily energized and holds the slide which approaches its pole face from following the related oscillating bail until the related keeper is moved to latching position as explained hereinafter. The finger which is moved downwardly is not deflected by the slide and engages a camming surface **58***d* on the upper portion of the interposer **58** to actuate the interposer. The interposer is pivoted about its enlarged portion **58***a* to bring the flange **58***b* at its lower end under the punch bail **62**. With the interposer in this position, the related punch **51** is actuated when the bail **62** moves downwardly.

The keepers **81** and **82** are pivotally mounted on the slides **75** and **76**, as previously explained, and if a slide does not follow its oscillating bail because of the attraction of energized magnet PM, then the keeper is rocked clockwise about its pivot point (Fig. 2) by the bail into latching engagement with a cooperating block. These blocks are designated **95** and **96** and extend between the machine side frames **38** and **39**. It should be noted that if the magnet is not energized, the keeper remains in its counterclockwise position and passes under the block. This is accomplished by providing the springs **94** with sufficient tension so that the slides **75** and **76** are pulled to the left faster than the bails **85** and **86** can rock the keepers **81** and **82** counterclockwise. The slides can therefore be said to lead the bails. The magnet PM, however, is of sufficient strength to hold a slide against the pressure of its spring **94**. This insures that the slide will make its full oscillating cycle. As soon as the keeper is partially latched, the magnet PM can be de-energized and the slide will move only sufficiently to take up the required latching lead. The slide is thus retained in its position near the magnet PM until the bail has almost completed its return stroke. The keeper is then moved counterclockwise until it is free of the latch block.

The upper end of each interposer **58** extends through a slot in a slidable restoring plate **97** (Fig. 1). This plate is pivotally supported at one end by a cam follower **98** and at the other end by a spring **99** which constantly

urges the plate to the right. The cam follower **98** carries a roller **100** which engages a cam **101** secured on a constantly rotating shaft **102**. A spring **103** extends between the follower **98** and side frame **38** to maintain roller **100** against the cam **101**. It is understood that similar operating mechanism is provided for the slide near frame plate **39** to produce a balanced structure. From Fig. 5 it is seen that the restoring cam **101** causes the plate **97** to move to the left at 120° which in turn engages any interposers which have been set up to move their flange **58***b* out from under the punch bail **62**. The interposers are completely restored by 157° to prepare the machine for the following punch setting-up operation.

The cards are carried to the punching station by the series of feed rollers previously described and are guided in proper punching position endwise by plates **105** (Fig. 3), but owing to various conditions, it is necessary to provide additional devices to exactly align the card sidewise under the punches. Referring to Fig. 2, the constantly rotating shaft **106** has a cam **107** fastened thereto which is engaged by a roller **108** carried by a cam follower **109**. Extending upwardly from a pivotal connection on follower **109** is a pair of links **110**, each connected pivotally at its upper end to the free end of a horizontal lever **111** pivotally mounted on a rod **112**. A spring **113** extends between each lever and a support plate **114** to maintain the roller **108** in engagement with the cam **107**. On their outer ends these levers carry bars **115** extending the greater part of the length of die plate **52**. Bars **115** are each provided with two upwardly projecting fingers **116**.

While a card is being pushed into place on the die plate **52** by feed rollers **21, 22** the roller **108** is on the high portion of cam **107**, and fingers **116** are in the position shown in Fig. 2. From Fig. 5 it is seen that the roller **108** leaves the high portion of the cam at 15° aided by the springs **113** whereupon the fingers **116** snap into position forcing the card at the punching station to register exactly with die plate **52**.

At 113° the roller **108** again moves onto the high portion of cam **107** to withdraw the fingers **116** from the path of the punched card resting on the die plate. The card is then engaged by the stop **119***a* on a cam **119** which is constantly rotated on shaft **118**. This cam frictionally moves the card between feed rollers **23, 24** from whence it is carried to the sensing station for reading by the brushes **25**.

To summarize briefly the operation of the machine the punches **51** are set up under control of the card passing under the sensing brushes **25** during the last half of a machine cycle. During this time, a blank card is being moved into the punching station. At the beginning of the following cycle the card aligning mechanism engages the card to hold it in proper registration for the punching operation. After the card is punched, it is released for advancement to the sensing station where it serves as a pattern card during the last half of the same cycle to set up the punches for the punching of the following blank card on the next cycle.

The wiring diagram

Referring now to Fig. 6 it is seen that the closure of switch S connects the machine to the source of electrical energy through the two main lines **130** and **131**.

For the gang punching operation, a master card is inserted at the bottom of a group of blank cards in the punch hopper R. The cards in the hopper actuate a card lever CL1 to close contacts CL1*a* and energize a relay magnet R10 through a circuit as follows: From line **130**, through relay R10, card lever contacts CL1*a*, to line **131**. The start key ST is then depressed and a circuit may be traced from line **130** through the pickup coil of motor relay R12, start key contacts STC, relay contacts R10*a* (now closed), stop key contacts SPC (normally closed), to line **131**. The energized motor relay

closes contacts R12*a* to complete a circuit through its hold coil. The *b* contacts of relay R12 are also closed to complete a circuit through the motor M which causes the motor to operate. The motor will keep running and the cards will be fed from the hopper R as long as they are present or until the stop key SP is depressed.

During the second card feeding cycle, which takes place immediately, the master card passes between the die plate **52** and punches **51** (Fig. 1) over to the sensing station at the same time that the first blank card immediately following the master card is moving from the hopper R to the punching station. Next, the punch card lever CL2 is actuated and contacts CL2*a* are closed completing a circuit from line **130** through the impulse distributor contacts CB which are closed during the sensing of each index point position, through contacts CL2*a*, common brush **132**, common contact roll **26**, sensing brush **25**, the coil of punch magnet PM to line **131**.

The movement of the cards is such that the blank card is brought to a halt under the punches **51** by the card aligning mechanism after the last index point position is read by the brushes **25**. All the holes 9 to 12 inclusive in any columns of the master card will be punched at one time in the related columns of the blank card.

The newly punched card is fed in turn from the punching station to the sensing station as a second blank card is fed into the punching station. Thus, the newly punched card acts as a master card to control the punching of the second blank card, and the second card controls the punching of the third, etc., until all of the blank cards are gang punched.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment, 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 perforating machine, means for sensing successively the index point positions of a record bearing data designations, a row of punches representing the index point positions of the record, a row of settable related interposers, an actuator for engaging each interposer, a first selecting element representing the even index positions and cooperating with certain of said actuators, a second selecting element representing the odd index positions and cooperating with other of the actuators, means for oscillating said elements and actuators with respect to the row of interposers, whereby said actuators are ineffective to engage said interposers, means responsive to the sensing of perforations in the record for interrupting the movement of the elements at differential times to position the related actuators for engagement with their related interposers, means for moving the positioned actuators at differential times to engage the related interposers, whereby a setting of the interposers is effected, and means for actuating the punches through said set interposers.

2. The machine as claimed in claim 1, in which the movement of the selecting elements is interrupted alternately by the interrupting means.

3. The machine as claimed in claim 1, wherein the selecting elements are oscillated 180° out of phase by the oscillating means.

4. In a machine of the class described, a plurality of interposers arranged in a column, a plurality of actuators arranged in a like column, one actuator being opposite each interposer, means for driving the actuators in succession toward their related interposers, said actuators being normally ineffective to drive the interposers but positionable to effect driving engagement, and

selectively settable means for causing such positioning of any actuator prior to its driving action, whereby the related interposer will be driven, said settable means including dual selecting devices, one device causing positioning of the first and alternate actuators and the other device causing positioning of the second and alternate actuators.

5. In a machine of the class described, means for sensing successively the index point positions of a record bearing data designations, a row of settable related interposers, an actuator for engaging each interposer, a separate bail for pivotally mounting each of said actuators, a first slide representing the even numbered index positions and cooperating with certain of said actuators, a second slide representing the odd numbered index positions and cooperating with other of the actuators, means for oscillating said slides and actuators, with respect to the row of interposers, whereby said actuators are ineffective to engage said interposers, means responsive to the sensing of perforations in the record for interrupting the movement of the slides at differential times to position the related actuators for engagement with their related interposers, a set of cam elements for operating each bail at differential times to move the positioned actuators into engagement with selected interposers, whereby a setting of these interposers is effected.

6. In a machine of the class described, means for sensing successively the index point positions of a record bearing data designations, a row of settable related interposers, an actuator for engaging each interposer, a first selecting element representing the even numbered index positions and cooperating with certain of said actuators, a second selecting element representing the odd numbered index positions and cooperating with other of the actuators, means for oscillating said selecting elements and actuators with respect to the row of interposers, whereby said actuators are ineffective to engage said interposers, a magnet for controlling the movement of the selecting elements, means for energizing said magnet in response to the sensing of perforations in the record to interrupt the movement of the elements at differential times, said elements causing the related actuators to be positioned for engagement with their related interposers, means for moving the positioned actuators at differential times to engage the related interposers, whereby a setting of the interposers is effected.

7. In a perforating machine, means for sensing successively duodecimal index point positions of a record, a row of punches representing the index point positions of the record, a row of settable related interposers, a shiftable plate having a series of slots therein, each interposer extending through one of said slots, an actuator for engaging each interposer, a first selecting element representing the even numbered index positions and cooperating with certain of said actuators, a second selecting element representing the odd numbered index positions and cooperating with other of the actuators, means for oscillating said elements and actuators with respect to the row of interposers, whereby said actuators are ineffective to engage said interposers, means responsive to the sensing of perforations in the record for interrupting movement of the elements at differential times to position the related actuators for engagement with their related interposers, means for moving the positioned actuators at differential times to engage the related interposers, whereby a setting of the interposers is effected, means for actuating the punches through said set interposers, and means for moving said plate after actuation of the punches, whereby said set interposers are restored.

8. In a machine of the class described, means for sensing successively the index point positions of a record bearing data designations, a row of settable related interposers, an actuator for engaging each interposer, a first selecting element representing the even numbered index positions and cooperating with certain of said actuators, a second selecting element representing the odd numbered index positions and cooperating with other of the actuators, means for oscillating said selecting elements and actuators with respect to the row of interposers, whereby said actuators are ineffective to engage said interposers, a magnet for controlling the movement of the selecting elements, each of said elements being alternately moved near the pole face of said magnet by said oscillating means, means for energizing said magnet in response to the sensing of perforations in the record to interrupt the movement of the elements at differential times by holding the element against said pole face, whereby the related actuators are positioned for engagement with their related interposers, means for moving the positioned actuators at differential times to engage the related interposers, whereby a setting of the interposers is effected.

9. In a machine for gang punching a group of record cards under control of a master card, said cards having columns of index point positions, a plurality of rows of punches representing the index point positions on the cards, a plurality of rows of settable related interposers, an actuator for engaging each interposer, a first selecting element for each row of interposers representing the even index positions and cooperating with certain of said actuators, a second selecting element for each row of interposers representing the odd index positions and cooperating with other of the actuators, means for oscillating said elements and actuators with respect to the row of interposers, whereby said actuators are ineffective to engage said interposers, card sensing means, means for feeding the cards successively, first under the punches and then past the sensing means, means responsive to the sensing of perforations in the master card for interrupting the movement of the elements at differential times to position the related actuators for engagement with their related interposers, means for moving the positioned actuators at differential times to engage the related interposers, whereby a setting of the interposers is effected, and means for actuating the punches through said set interposers, whereby each card is perforated with the data sensed on the preceding card.

10. In a cyclically operable machine for gang punching a group of record cards under control of a master card, said cards having columns of duodecimal index point positions, a plurality of rows of punches representing the index point positions on the cards, a plurality of rows of settable related interposers, an actuator for engaging each interposer, a first selecting element for each row of interposers representing even numbered index positions and cooperating with certain of said actuators, a second selecting element for each row of interposers representing the odd numbered index positions and cooperating with other of said actuators, means for oscillating said elements and actuators with respect to the row of interposers, whereby said actuators are ineffective to engage said interposers, means for sensing the index positions on the cards, means for feeding the cards successively, first under the punches and then past the sensing means, a magnet for controlling the movement of the elements, means for energizing said magnet in response to the sensing of perforations in the record to interrupt the movement of the elements at differential times, said elements causing the related actuators to be positioned for engagement with their related interposers during a cycle of operation, means for moving the positioned actuators at differential times to engage the related interposers, whereby a setting of the interposers is effected, and means for actuating the punches through said set interposers on the following cycle of operation, whereby each card is perforated with data sensed on the preceding card.

11. In a machine of the class described, a plurality of interposers arranged in a column, a plurality of actuators arranged in a like column, one actuator being opposite each interposer, means for driving the actuators in succession toward their related interposers, said actuators being normally ineffective to drive the interposers but

positionable to effect driving engagement, a pair of oscillating slides for causing such positioning of an actuator prior to its driving action, one slide causing positioning of the first and alternate actuators and the other slide causing positioning of the second and alternate actuators.

12. The machine as claimed in claim 11, in which a magnet is provided to control the movement of the slides, means for alternately moving said slides near the pole face of said magnet, and means for selectively energizing said magnet so that the movement of the slides is interrupted at differential times by the magnet holding the slide against its pole face.

References Cited in the file of this patent

UNITED STATES PATENTS

1,110,261	Hollerith	Sept. 8, 1914
1,138,314	Powers	May 4, 1915
1,848,159	Carroll	Mar. 8, 1932
2,623,592	Knutsen	Dec. 30, 1952