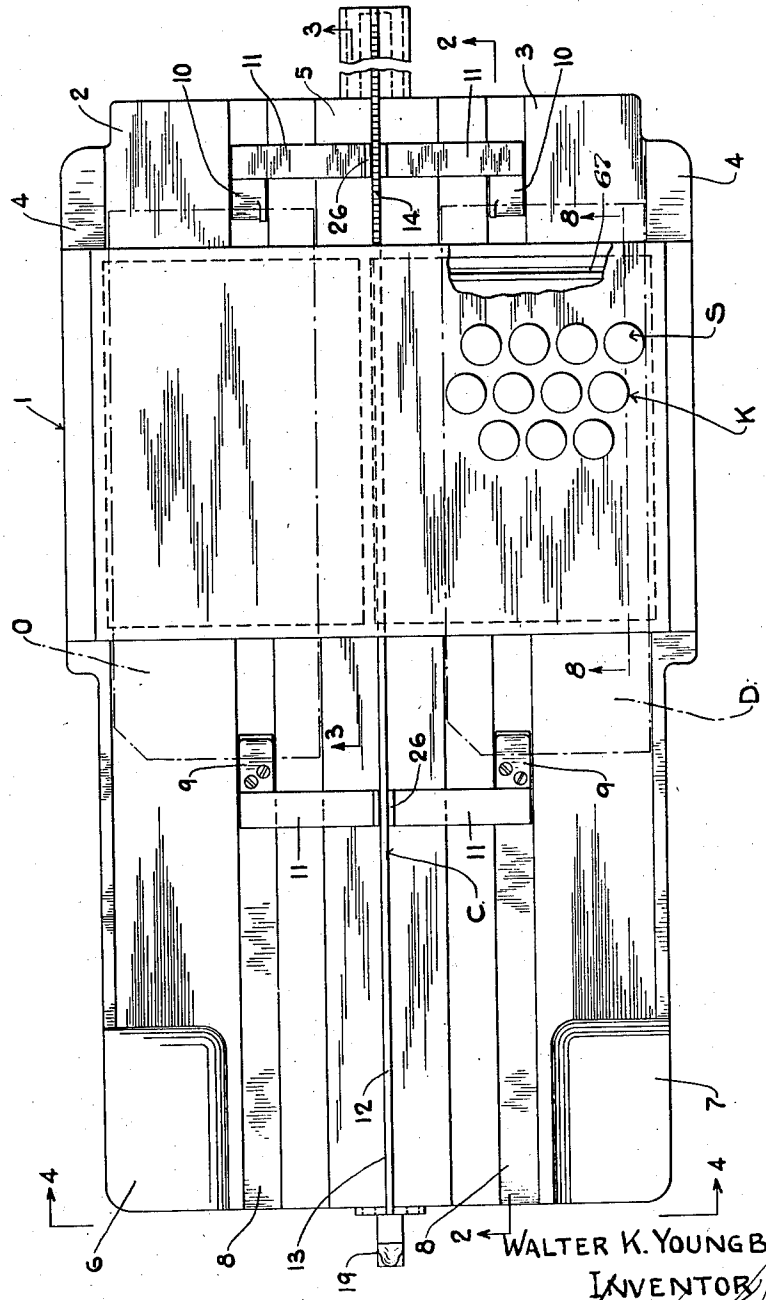
May 11, 1937. W. K. YOUNGBERG 2,080,192

VERIFYING PUNCH MACHINE FOR DUPLICATE CARDS

Filed Nov. 26, 1935 5 Sheets-Sheet 1

FIG 1.



WALTER K. YOUNGBERG
INVENTOR

BY

ATTORNEY

May 11, 1937. W. K. YOUNGBERG 2,080,192

VERIFYING PUNCH MACHINE FOR DUPLICATE CARDS

Filed Nov. 26, 1935 5 Sheets-Sheet 2

FIG 2

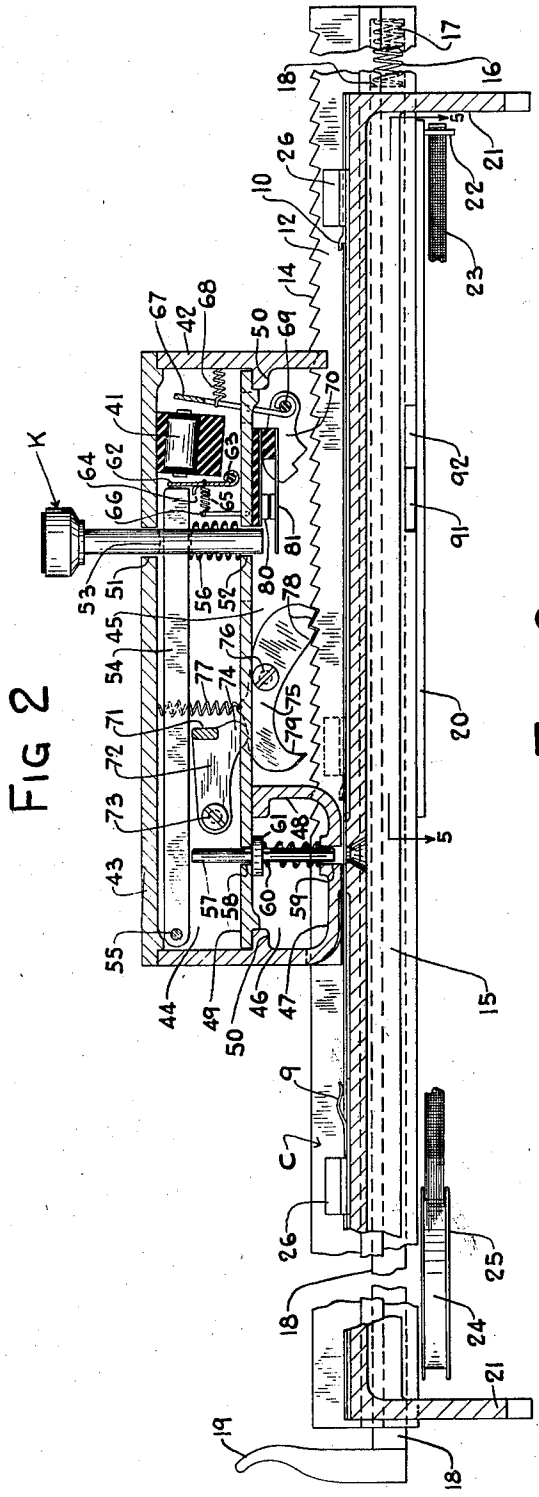
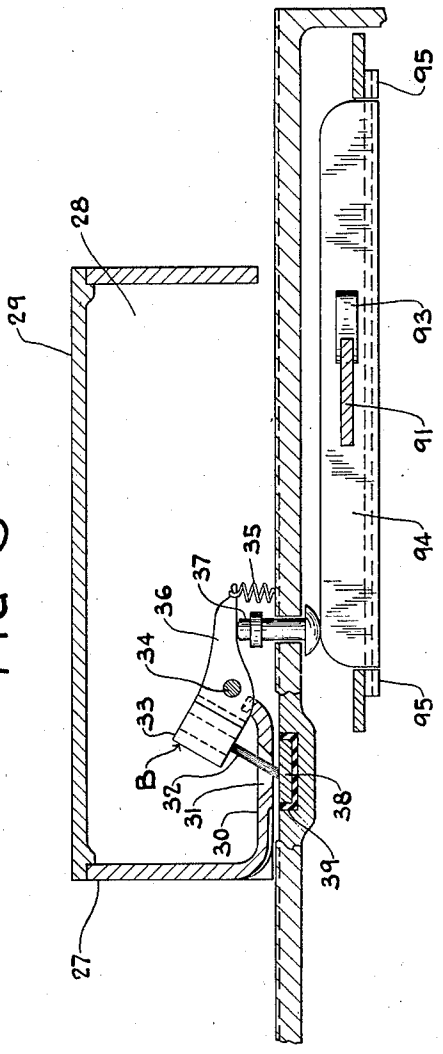


FIG 3



WALTER K. YOUNGBERG
INVENTOR

BY

ATTORNEY

May 11, 1937. W. K. YOUNGBERG 2,080,192

VERIFYING PUNCH MACHINE FOR DUPLICATE CARDS

Filed Nov. 26, 1935 5 Sheets-Sheet 3

FIG 4

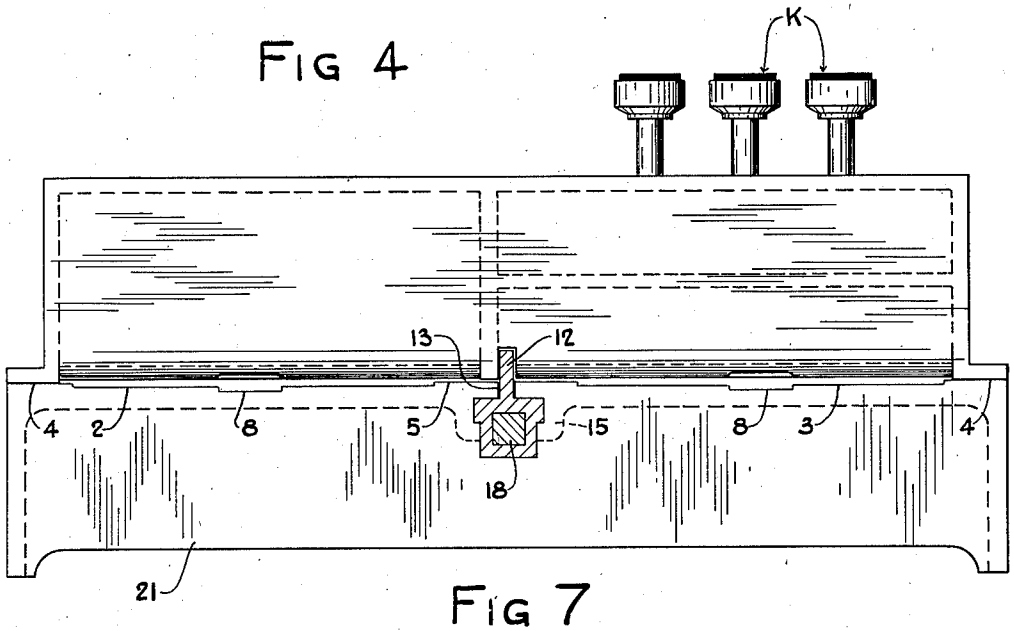


FIG 7

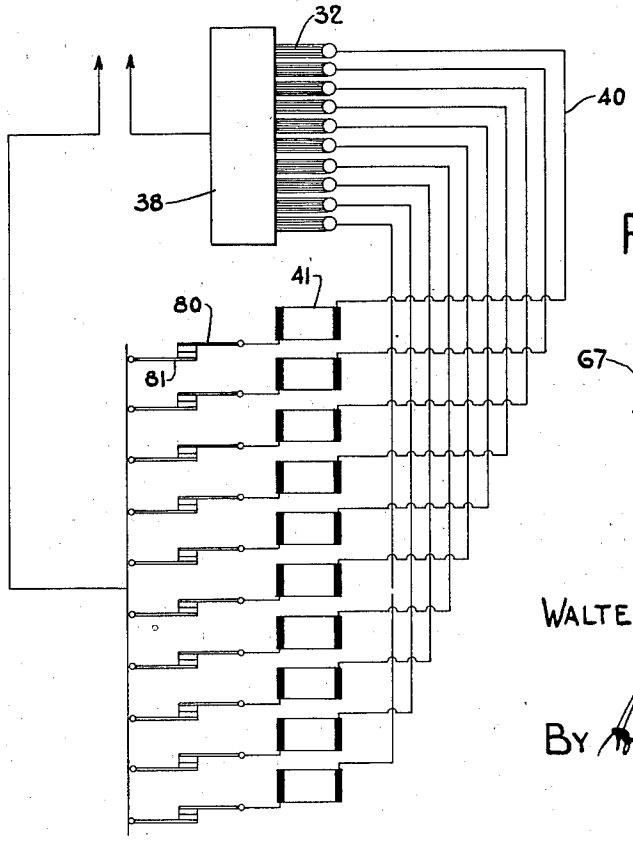
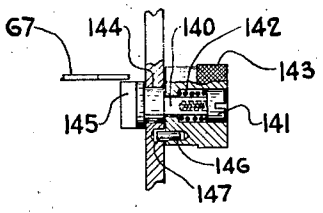


FIG 12



WALTER K. YOUNGBERG.
INVENTOR

BY

ATTORNEY.

May 11, 1937. W. K. YOUNGBERG 2,080,192

VERIFYING PUNCH MACHINE FOR DUPLICATE CARDS

Filed Nov. 26, 1935. 5 Sheets-Sheet 4

FIG 9

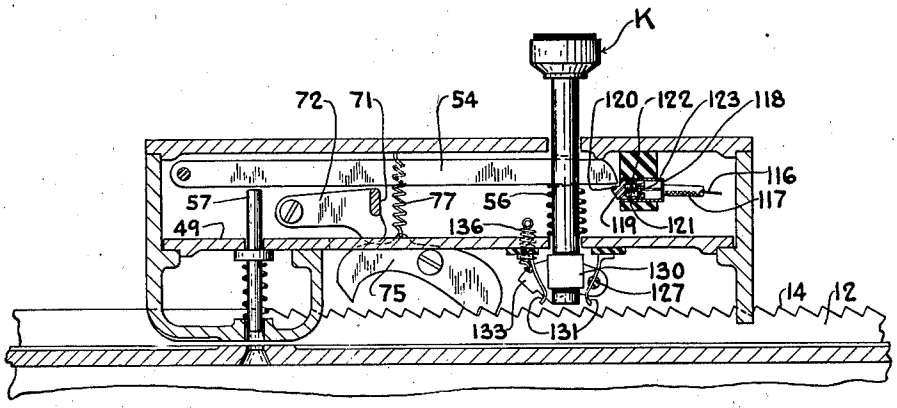


FIG 10

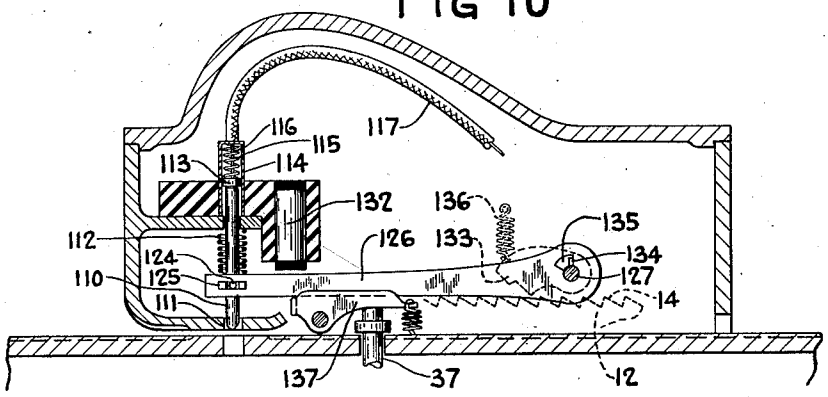


FIG 5

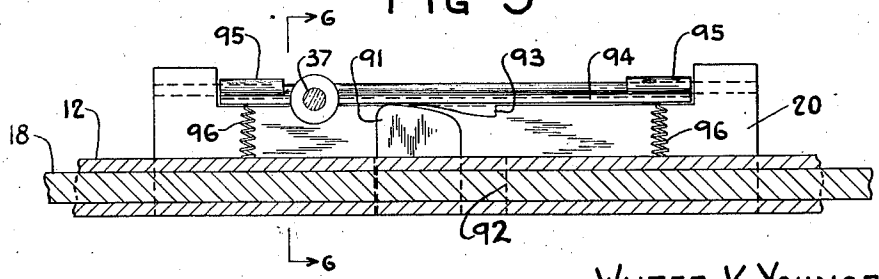
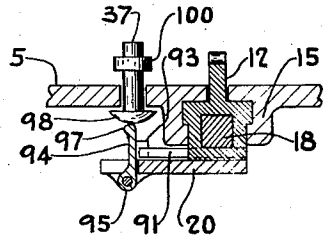


FIG 6



WALTER K. YOUNGBERG
INVENTOR

BY

ATTORNEY

May 11, 1937. W. K. YOUNGBERG 2,080,192

VERIFYING PUNCH MACHINE FOR DUPLICATE CARDS

Filed Nov. 26, 1935 5 Sheets-Sheet 5

FIG 11

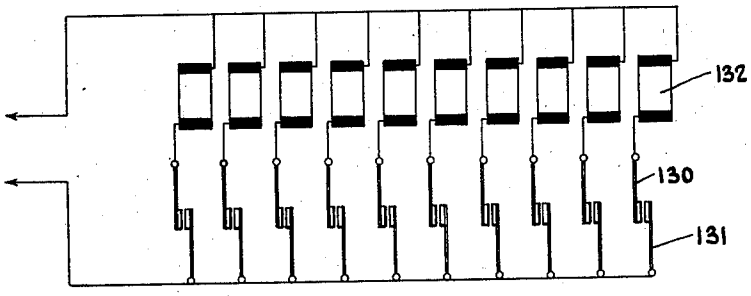


FIG 8

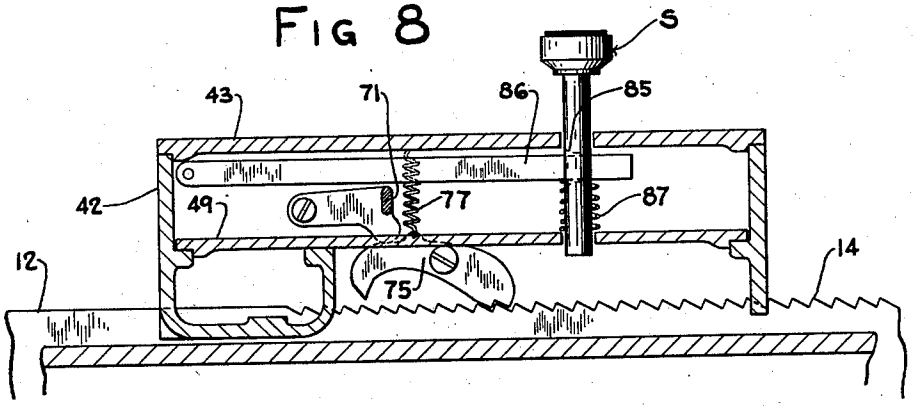
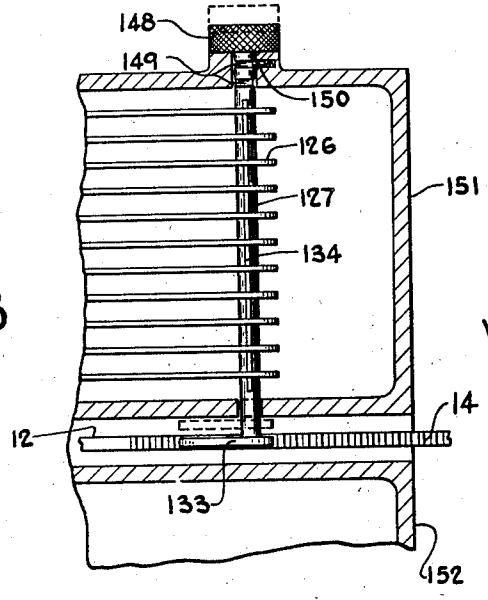


FIG 13



WALTER K. YOUNGBERG
INVENTOR

BY

ATTORNEY

Patented May 11, 1937

2,080,192

UNITED STATES PATENT OFFICE

2,080,192

VERIFYING PUNCH MACHINE FOR DUPLICATE CARDS

Walter K. Youngberg, Meriden, Conn.

Application November 26, 1935, Serial No. 51,707

65 Claims. (Cl. 164—113)

My invention relates to verifying punch machines for duplicate cards.

It has heretofore been the practice in punching duplicate cards for use in duplicate card systems to have the different cards of the several pairs punched by different operators working from the same data in order to minimize the possibility of repeating the same error. Thus, in establishments of the large size usually using such card systems, as for example an insurance company, a large group of girls, each operating a similar punching machine, is required, with half of the girls punching one half of the several pairs and with the remainder of the girls punching the other half. Nevertheless, errors have occurred as the different operators, while not apt to make the same error, will make different errors, and verification of the cards has thus been necessary before the same could be used. Accordingly, after the cards are punched, it has been the practice to have the same compared manually, or in a number of separate machines, or at a central point by a single machine of large capacity, such, for example, as that described and claimed in my Patent No. 1,989,049, patented January 22, 1935. As a result of the above practices, in such large offices it has been necessary not only to require the services of a large number of girls for punching and verifying, but also to require the provision and maintenance of a large number of different machines, including one for each punch operator and either a number of small verifying machines, or a large and expensive verifying machine such as disclosed in my patent.

My invention has among its objects to enable a given number of duplicate cards to be punched and verified with markedly reduced expense. A further object of my invention is to make it possible for the cards to be verified during the punching operation in such manner that the subsequent verification is eliminated with a resultant reduction in both labor and equipment required, all whereby the need for the services of the girls heretofore required in manually verifying and all need for any separate verifying machines are made unnecessary. A further and more particular object is to provide an improved verifying punch machine with which one half of the ordinary punching staff may be equipped, and which is adapted not only to be used in the ordinary manner as a punch but also to function as a verifying machine so that, when the second half of the cards has been punched on these machines, all of the cards are ready for use without the further separate verification heretofore necessary. Other objects of my invention are to provide such an improved punching machine having improved controlling mechanism. Thus, for example, I provide improved means whereby the punching keys of the improved machine are so controlled as to lock all of the keys thereof except the one which agrees with the punching on the original card, and further provide improved controlling means locking the machine in case an erroneous double punch has occurred on the original card, while also making impossible a double punching error by the operator of the improved machine, all whereby errors in either the original or the duplicate card may be detected while the duplicate card is being punched. Still other objects of my invention are to provide an improved machine having the above and other advantages and improved control and structural features, hereinafter described, and one which is nevertheless capable of normal and rapid operation by a punch machine operator, while also being of such inexpensive construction as to make it possible, through the reduction in labor costs and equipment, very quickly to effect a substantial saving. These and other objects and advantages of my invention will, however, hereinafter more fully appear.

In the accompanying drawings I have shown for purposes of illustration two embodiments which my invention may assume in practice, the same being shown herein in one form as embodying a preferred type of electrical sensing mechanism therein and in another form as having a preferred type of mechanical sensing mechanism included therein.

In these drawings,—

Fig. 1 is a plan view of a combined verifying punching machine of the electrical type constructed in accordance with my improvements;

Fig. 2 is a longitudinal sectional view on line 2—2 of Fig. 1;

Fig. 3 is a sectional view on line 3—3 of Fig. 1;

Fig. 4 is a front end view of the machine as seen from the left in Fig. 1;

Fig. 5 is a detail sectional view on line 5—5 of Fig. 2;

Fig. 6 is a detail sectional view on line 6—6 of Fig. 5;

Fig. 7 is a wiring diagram of the illustrative form of controlling and locking mechanism employed;

Fig. 8 is a sectional view corresponding to Fig. 2 and showing the spacing key mechanism, the section being taken on line 8—8 of Fig. 1;

Fig. 9 is a view similar to Fig. 2 showing a portion of a machine of a modified construction including a mechanical type of sensing mechanism;

Fig. 10 is a view of the latter machine and similar to Fig. 3 and showing cooperating devices used in the mechanical sensing mechanism;

Fig. 11 is a wiring diagram of the illustrative form of this modified controlling and locking mechanism;

Fig. 12 is a detail view showing means for adapting the construction shown in Figures 1 to 8 for operation as a simple punching machine, and

Fig. 13 is a like detail view showing like mechanism applied to the modified construction shown in Figures 9 to 11.

Referring first to the machine shown in Figs. 1 to 7, it will be noted that I have therein illustrated a machine adapted to receive and feed through at one side of the same, i. e. at the side remote from the operator and indicated at the top in Fig. 1, an original previously punched card, hereinafter called the original card, indicated at O, and also adapted to receive and feed simultaneously through the other side adjacent the operator, shown at the bottom in Fig. 1, a card to be duplicated, hereinafter called the duplicate card, indicated at D, as the machine operator punches the duplicate card D; this punching operation being effected by operating keys, generally indicated at K, which are under the control of electric sensing mechanism operating on the original card O and including brushes generally indicated at B in Fig. 3 and hidden in Fig. 1, so that the two cards O and D are verified while punching the card D, all as hereinafter more fully described.

Referring more particularly to Fig. 1, it will be noted that the machine comprises a frame, generally indicated at 1, having therein parallel original and duplicate card passages 2 and 3, respectively, both of which are lower than either of the side walls 4 of the frame or a central portion 5 on the latter disposed between the card passages 2 and 3 and parallel thereto. As shown, the card passages 2 and 3 are provided with card removing recesses 6 and 7 at their left-hand or discharge ends, and each of the same is also provided with a longitudinal groove 8. In these grooves 8 are disposed card holding clips 9 engaging the front ends of the cards and card holding clips 10 engaging the rear ends of the cards. Further, these clips 9 and 10 are movable in the grooves 8 longitudinally of the frame 1 with a carriage, generally indicated at C; the sets of clips 9 and 10 herein being carried on transverse arms 11 suitably attached to and movable during punching of the card D, with the carriage C as the latter is moved step by step toward the left when, subject to the control of the brushes B (Fig. 3), successive keys K are operated.

Considering the carriage mechanism C, it will be observed that the same includes a rack 12 movable in a central slot 13 in the portion 5 of the frame and having an exposed upper rack surface which has teeth 14 on the right-hand end thereof, these teeth herein being shown as slanting to the left and extending over only as much of the rack as necessary to effect the desired carriage movement. Further, this rack member 12 is mounted in guides 15 in the frame portion 5 and has a spring 16 housed under its right-hand end in a chamber 17 and acting against the right-hand end of a rod 18, herein of square cross section and extending the full length of the frame and projecting from the left-hand end thereof where it carries an upstanding operating member 19. Further, as shown in Fig. 2, the rack 12 is fixed to and movable with a member 20 disposed beneath the rack and between the supports 21 of the frame 1. This member herein is connected through a depending lug 22 and a suitable strap 23, with a coiled or helical spring 24 which is, in turn, mounted on a suitable spool 25 rotatably mounted beneath the underside of the frame 1, herein at a point adjacent the left-hand end support 21. Attention here is further directed to the fact that both of the card clip arms 11 are suitably fixed to the rack member 12, as indicated at 26. As a result of this construction, it will be noted that the carriage C will be continually urged to the left under the action of the spring 24 in such manner as to cause both original and duplicate cards O and D to be moved to the left when the rack 12 is released during the punching operation for step by step movement, as hereinafter described.

Operatively associated with the rack teeth 14 is improved mechanism for effecting this step by step movement as the proper keys K are operated, this mechanism herein being controlled by the brushes B so that the carriage C may not advance unless the punchings already made in the original card O correspond to those which the operator attempts to make in the duplicate card D. Further, unless the sensing mechanism, including the hidden brushes B and acting upon the similarly hidden original card O, indicates agreement between a punching in the original card and the supposedly corresponding punching which the operator seeks to insert in the duplicate card by operating any particular key K, a feeding movement of the carriage and cards cannot be effected by pressure on any key K other than the particular key corresponding to the punching of the original card O. Accordingly, when the operator's data indicates that the key K she has tried to depress to punch the duplicate card, is the correct key, and yet the key is locked and the carriage C will not feed, the operator knows that there is an error in the punching of the original card, while such a recheck of the data would also reveal the error if being made by the operator.

As the sensing mechanism controls the keys K, this sensing mechanism will, accordingly, be first described. As shown in Fig. 3, it is mounted in a suitable casing 27 disposed over the original card passage 2 slightly nearer the right-hand end thereof. This casing herein has a brush operating chamber 28 therein and also a removable cover 29, while being of such dimensions as to hide a considerable portion of the card O. As shown, the casing 27 also has a bottom lip 30 suitably formed or attached thereto and provided with a slot 31 near the left-hand wall of the chamber 28 and so disposed above the card passage 2 that the original card O may pass in under this slot 31. Further, it will be observed that a series of brushes 32 of a construction usual in electric sensing mechanisms, is so mounted in the chamber 28 that in their down or operative position these brushes may engage the top surface of the card being fed, and one or more of these brushes may thus project through any punching or punchings in the column on the card then under the slot 31. Herein, ten such brushes 32 are provided, corresponding to the digits 1 to 9 and 0, and all of these carried in a

U-shaped brush holder 33 pivotally mounted on a transverse pivot 34 in the chamber 28. Further, as illustrated, a coiled spring 35, acting between a rearwardly extending arm 36 on the brush holder 33 and the hollow of the chamber, normally tends to pull the arm 36 down and thus hold the brush holder 33 in a raised or inoperative position, wherein the brushes do not engage the card. Also, a plunger 37 operated by mechanism hereinafter described, is adapted to engage the arm 36 and raise the latter and thus lower the brushes 32 into the operative position so that if a punching is in the column of the card then in the slot 31, the corresponding brush 32 will engage a conducting strip 38 which extends along beneath the slot and is mounted in suitable insulation 39 in the bottom surface of the card passage. Attention here is further directed to the fact that each brush is connected by a conductor 40 to a magnet 41 controlling the keys and carriage feeding mechanism. Thus, it will be evident that with the brushes 32 in their down or operative position, whenever any brush passes through a punching in the original card, current will flow from the conducting member 38 through that brush and conductor 40 to its connected magnet 41 in such manner as to enable the corresponding key and the carriage C to be controlled in an improved manner through improved mechanism hereinafter described.

This mechanism is shown in Fig. 2 and inasmuch as its structure is the same for each of the keys K corresponding to the digits 1 to 9 and 0, a description of the same in connection with the single key illustrated in that figure will suffice. Referring more particularly to Fig. 2, it will be noted that the keys K are mounted for usual vertical operation in a casing 42, generally corresponding to the brush casing 27 and having a cover 43, generally corresponding to the cover 29; the two casings, if desired, being parts of a single casing separated by a suitable septum, and the two covers being integrally united. Herein, further, it will be noted that the space in the casing 42 is divided into three chambers 44, 45 and 46 by a bottom extension 47, generally corresponding to the portion 30 of the casing 27 and herein having an upwardly extending portion 48 which engages and supports a horizontal plate or septum 49 supported on lugs 50 on the casing 42. Thus, the chamber 44 is formed above the member 49, and chambers 45 and 46 are formed in rear and in front of the member 48. In these chambers, the operating and controlling elements for the several punches for the card D and the several keys K for operating the same, as well as the feeding mechanism for the carriage C, are disposed and interconnected in an improved manner.

Referring first to the punching mechanism, it will be noted that the key K is vertically disposed and movable through an aperture 51 in the cover 43 while its lower end is similarly movable through an aperture 52 in the plate 49. As shown the key K also has a transverse slot 53 therein just below the cover 43 and provided with rounded end portions and the rear end of a punch operating lever 54 extends through this slot. Thus, this lever may be moved downward about the lever pivot 55 at the front of the casing 42 whenever its corresponding key K is depressed, unless this key and lever movement is prevented by other means hereinafter described. As shown, a coiled spring 56 is also disposed around the lower end of the key between the lever 54 and the plate 49 so that this spring is tensioned upon downward movement of the lever with the key K. Also, the lever 54, when thus moved downward, is adapted to engage the upper end of a punch member 57 reciprocably mounted in apertures 58 and 59 in the members 49 and 47, respectively, to cause the lower or punching end of the punch 57 to punch the column in the duplicate card D which is disposed in the card passage 3 beneath the member 47. To effect the automatic return of the punch 57 to its raised or inoperative position, a coiled spring 60 is also disposed around the lower end of the punch beneath a shoulder 61 thereon, with one end of the spring acting on this shoulder and the other abutting a suitable collar on the member 47. Thus, when the key K is freely operable, the depression of the same will cause the punch 57 to be depressed to insert a punching in the duplicate card, corresponding in position to the key which is depressed, while as soon as the key K is released, the punch will be returned to its normal or inoperative raised position by the spring 60.

To control the movement of the key K and lock the same against operation when an error occurs in the original card O or is about to be made in the duplicate card D, i. e. when it is attempted to depress the wrong key K, improved controlling connections are provided herein for the key. These are controlled by the magnet 41 heretofore described. Here, the magnet 41 is provided with an armature 62 mounted on a pivot 63 beneath the free end of the lever 54. Further, this armature 62 is provided with a laterally extending lug 64 thereon which is adapted when the magnet 41 is deenergized, to underlie the end of the lever 54, as shown in Fig. 2, while the armature 62 is normally held in the position illustrated in that figure by a coiled spring 65 connected to an upstanding support 66. Accordingly, unless current is flowing through the magnet 41, the armature 62 is disposed in the position shown in Fig. 2 by this spring 65, and, downward depression of the free end of the lever 54 being thereby made impossible, neither the key K nor its corresponding punch 57 can be operated. On the other hand, if there is a corresponding punching in the original card O and, accordingly, the brush 32 controlling the magnet 41 can complete a circuit from the conducting plate 38 through the brush and the conductor 40 to the magnet 41, then, the armature 62 will be attracted by the magnet in such manner as to withdraw the lug 64 from beneath the end of the lever 54 while tensioning the spring 65. Further, the lever 54 then being free from further obstruction to downward movement, the key K corresponding to that lever and that magnet, will be free to be depressed to operate its punch 57 and thereby punch the duplicate card D in a position corresponding to the punching in the original card O.

Associated with the mechanism above described is also improved mechanism for holding the carriage stationary in the event of a double punching in the original card. Here, it will be noted that this mechanism includes a second armature 67 (Figs. 1 and 2) on the opposite end of the magnet 41 from the armature 62 and controlled by the magnet and a spring 68 and movable about a pivot 69 while having a lower rack holding pawl 70 movable therewith about that pivot. This pawl 70 is accordingly moved into holding engagement with the rack teeth 14 each time the magnet is energized, in such manner as to hold

the carriage C stationary, and this pawl 70 is also moved to release the rack 12 whenever the magnet 41 is deenergized through mechanism hereinafter described. Here it will be understood that the so-called second armature 67 is in the form of a single plate, or universal bar, extending across behind all of the magnets 41 and that a single spring 68 acts on this plate, this spring being sufficiently strong to swing the holding pawl 70 out of holding position, but not sufficiently strong to overcome the pull of any magnet 41. Further, it will be understood that this pawl 70 functions only to prevent a feeding movement of the rack 12 when there are two punchings in the original card O, as hereinafter described, and has no feeding function, the feeding of the carriage C being effected by wholly distinct feeding mechanism hereinafter described.

This feeding mechanism includes escapement mechanism adapted to effect a slight forward movement of the carriage C when the key K is depressed and just before the punch 57 is forced through the duplicate card, and also a further and longer forward movement of the carriage C as the key K is returned to raised position by the spring 56. In the illustrative construction, each of the levers 54 overlies a common crossbar 71 on a U-shaped pivoted member 72 disposed within the chamber 44 and pivoted at 73. Herein, it will also be observed that this member 72 is provided with a depending portion 74 thereon engageable with the forward end of a pawl 75 pivoted at 76 above the rack 12 and having a coiled spring 77 connected to the same in advance of its pivot and also attached at its opposite end to the cover 43 in any suitable manner. In the form illustrated, this pawl 75 is also provided with a pair of teeth 78 on its rear end which are adapted to be disposed on opposite sides of any tooth 14 on the rack 12, while the opposite end of the pawl is provided with a single tooth 79 adapted to be lowered into engagement with the teeth 14 on the rack when the teeth 78 are raised.

Accordingly, whenever any key K is unlocked and depressed, the depression of the same will cause a downward movement of the lever 54. Since this lever engages the portion 71 on the member 72, the latter will in turn swing about its pivot 73, and, through the extension 74 on the member 72, first cause the pawl 75 to have its tooth 79 engage with the teeth 14, and, thereafter, cause the teeth 78 on the pawl to disengage the teeth 14. Thus, after the disengagement of the teeth 78, the rack 12 and carriage C will be moved to the left by the spring 24 through a distance equal to a very small part of the distance between the centers of adjacent columns on the cards O and D, i. e. until further forward movement is prevented by tooth 79, when the selected column of the duplicate card will then be accurately centered under the punches 57. Further, it will be apparent that when pressure on the key K is released, i. e. when one of the punches 57 is still in the card D, the key K is thereupon urged upward by its spring 77 in such manner as to release the tooth 79 from the rack and thus cause the teeth 78 to re-engage the rack, which in the interval between this release and this re-engagement, has been moved with the carriage C by the spring 24 through the remainder of the distance between adjacent column centers. In other words, each time that a key K is depressed to effect punching in a column on the duplicate card D, the whole carriage C, which carries both the duplicate card D and the original card O, will be moved forward a total distance corresponding to one tooth 14 on the rack 12, in such manner as to bring a new column on the original card into registry beneath the brushes 32 and a new column on the duplicate card D into proper corresponding position ready to be centered under the punches 57 on depression of the next key. Thus, the mechanism is ready to verify another column on the original card O and punch another column on the duplicate card D; this operation, of course, being repeated until the original card has been completely verified and the duplicate card both completely punched and verified.

Cooperating with this mechanism is also improved mechanism controlling the circuit of the magnet 41 and adapted to return the key locking mechanism to its normal locked position, while releasing the holding pawl 70 from the rack teeth 14, both of these operations occurring before the key K has completed the actuation of the punch and escapement mechanism. This mechanism is operated by the lower end of the key K in the course of the downward movement thereof and includes a switch disposed beneath the plate 49 and comprising a stationary contact 80 connected in the circuit of the magnet 41 and a movable spring contact 81 normally cooperating with the stationary contact 80. The free end of this spring contact 81 extends beneath the end of the key K below the aperture 52 in the plate 49. Accordingly, when the key K has been depressed and before it has been depressed sufficiently to operate the punch 57, and also before it initially operates the escapement pawl 75, the end of this key engages the end of the movable contact 81 and thereby breaks the circuit through the contacts 80, 81. This opens the circuit of the magnet 41 and thereby effects the release of the armatures 62 and 67 by the magnet 41. As a result, the armature 62 is pulled back by its spring 65 ready to resume its locking position shown in Fig. 2 when the key K has returned to its normal up position. Further, the armature 67 is also returned by its spring 68 to the position shown in Fig. 2, wherein the holding pawl 70 is released from the teeth 14 of the rack 12.

The latter rack when it completes its full forward movement of one tooth, is of course then held in its new position by the re-engagement of the teeth 78 on the pawl 75 with the teeth 14 on the rack. Further, the whole mechanism is again under the control of the brushes 32 which function as heretofore to keep all keys K locked unless there is a punching in the column of the original card O corresponding to the punching in the duplicate card D which would be formed by punching the particular corresponding key K. However, it will be noted that in the event that there are two punchings in the same column of the original card, and therefore two brushes 32 releasing two keys K, the carriage will continue to be locked if only one of these keys K is operated. Under such conditions, the magnet 41 of the other key then will continue to hold holding pawls 70 in engagement with the teeth 14 of the rack 12. Thus the operator being unable to advance the carriage after punching the correct key indicated by her data, will know that there is a double punching in the original card and accordingly make the necessary correction.

Attention is also directed to an improved space key mechanism which is herein provided and adapted to be used to effect spacing whenever there is no punching in the column of the origi-

nal card O which is beneath the brushes 32. This key, indicated at S, is an additional key independent of the keys K which correspond to the digits 1 to 9 and 0. Further, while certain of the mechanism associated with this key S is generally similar to that heretofore described in connection with the keys K, it differs therefrom in certain respects. Referring to Fig. 1, it will be noted that the key S is herein the key nearest the operator. Further, as shown in Fig. 8, it will be observed that this key is provided with an opening 85 therein, corresponding to the opening 53, and through which a lever 86, corresponding to the lever 54, is extended, while a coiled spring 87, corresponding to the coiled spring 56, is disposed beneath the lever 86 surrounding the lower end of the key. Here also, the lever 86 is adapted to engage bar 71, and thereby to actuate the escapement pawl 75, which in turn is connected to the spring 77, all as heretofore described. However, in this mechanism there is neither a magnet, nor a punch, nor a locking mechanism, nor a switch associated with the key S such as heretofore described as associated with the several keys K. Accordingly, when there is no punching in any column of the original card and all the keys K corresponding to 1 to 9 and 0 remain locked, this space key S may be depressed to effect a forward spacing operation of the carriage C and both cards O and D and thus enable the duplicate card to have an unpunched column corresponding to the unpunched column in the original card. Here, however, it will be noted that, if a hole is punched in the original card and the operator of the machine erroneously operates the space key S, that key, while being depressible, will not cause any movement of the carriage C. Instead, the latter, still being locked by the magnet 41, on account of the universal bar 67 which controls the particular key K corresponding to that punching and brush 32, only the operation of the correct key to effect a corresponding punching, will release the holding pawl 70 associated with that magnet and thereby permit the carriage to be moved.

With the various mechanisms so far described, it will be evident that the original and duplicate cards in the machine may be verified while the latter card is being punched. Further, it will be evident that when the duplicate card has been completely punched, the carriage C will have advanced to such a position on the frame 1 as to cause the forward ends of the cards to be over the recesses 6 and 7 and thereby permit both cards O and D to be readily withdrawn from their holders 11. When the cards have been thus removed and a new original card and a new unpunched duplicate card have been inserted in their places, it will also be observed that I have herein provided improved mechanism for returning the carriage to its initial position at the right of the frame in Fig. 1 ready to begin again the verifying and punching operation in connection with these cards. This mechanism is operated by the upstanding operating member 19 heretofore mentioned and includes improved mechanism for raising the brushes 32 from their operative position shown in Fig. 3, so that they will be out of the path of the new original card as the carriage C is moved back to initial position.

Referring more particularly to this mechanism, when the operating lever 19 is pushed to the right from the position shown in Fig. 2, the rod 18 will be moved therein to compress the spring 16. Further, it will be observed that the rod 18 is provided with a projecting fin 91 which extends laterally through a slot 92 in the bottom of the rack 12. Thus, when pressure is applied to the operating member 19 and the spring 16 is compressed, the rod 18 is free to slide inside of the rack 12 until the fin 91 is stopped by the right-hand wall of the slot 92. Further, as the fin 91 is so moved, the outer edge of the same presses against a wedge 93 carried on a swinging member 94 pivoted on pivots 95 and normally held in the elevated position shown in Fig. 6 by coiled springs 96 connected between the member 94 and a fixed part of the frame. Moreover, it will be observed that when the member 94 is in the upright position shown in Fig. 6, the free edge 97 of the latter engages and supports a rounded bottom portion 98 on the vertically disposed and movable pin 37 which, in turn, supports the arm 36 on the brush holder 33 in such manner as to hold the latter in the position shown in Fig. 3 while tensioning the spring 35. Accordingly, when the member 91 engages the wedge 93, the member 94 is forced to the left about its pivots 95 from the position shown in Fig. 6 while tensioning the springs 96, in such manner as to release the pin 37 and thereby permit the latter to drop downward to the limit established by a collar 100 thereon. As a result, the arm 36 of the brush holder is released so that the spring 35 which acts on this arm is then free to pull the same downward and thereby swing the brush holder about its pivot 34 and raise the brushes 32 out of the path of the original card. Further, it will be evident that the brushes will be maintained in this raised position and out of contact with the original card so long as pressure on the operating member 19 is continued; and as the carriage C and the rack 12 move to the right to their initial position wherein the new original card O and new duplicate card D are in their proper positions under the slot 31 and the punches 57 respectively. Then, when the operating member 19 is released, the parts will be automatically returned to the position shown in Fig. 6 due to the action of the connected springs 16 and 96, and the pin 37 will again be forced up under the arm 36 of the brush holder 33 in such manner as to lower the brushes 32 into their operative or sensing position illustrated in Fig. 3.

The operation of the complete machine will next be considered. Assuming that the carriage is in the position illustrated in Figure 2 and that an original card is under the brushes 32 and a duplicate card under the punches 57, it will be evident that no key K will be free to operate its corresponding punch 57 unless the brush 32 corresponding to the particular key extends through a punching in the original card; each lever 54 otherwise being held against depression by the lug 64 on the armature 62 when the latter is held in its inoperative position. Should, however, one of the brushes 32 extend through a punching in the original card O, the corresponding key K will be released as a result of current flow through the conducting strip 38, the brush 32, the conductor 40, the magnet 41 and the switch contacts 80, 81. More particularly, the particular magnet 41 then being energized, its armature 62 will be attracted in such manner as to release the lever 54 so that its key K may then be depressed. This downward movement of the key will result first in breaking the circuit of the magnet 41 at the switch contacts 80, 81 and thus cause the holding pawl 70 to be released and the armature 62 also to be re-

leased ready to be returned to locking position upon upward movement of the bar 54 following release of the key K. Forward movement of the key K also depresses lever 54 which depresses the member 72 and thereby pushes down the front end of the escapement pawl 75 in such manner as to engage the tooth 79 with the rack and cause the teeth 78 to disengage the latter. Thus there will be a slight forward movement of the carriage C. Further, it will be noted that this forward movement will occur just before the punch 57 is forced through the duplicate card. Moreover, it will be apparent that when the circuit of the magnet 41 is broken, the armature 62 thereof will be swung back by its spring in such manner as to enable the lever 54 to be automatically held in its up position after this lever and the key have been automatically returned thereto by the spring 56. Following release of the key K, the carriage C will be fed forward or to the left an additional amount so that the total of these two forward movements correspond to one tooth on the rack 12 and one column on the cards O and D. This operation will be continued so long as there are punchings in the original card and the operator in punching the duplicate card strikes the keys accurately. Should, however, a key not be depressible, the operator knows either that she is attempting to make a mistake or that a mistake has been made in the original card. However, note that the operator of the machine is not permitted to make her mistake by reason of the locking of her key. Thus checking back on her data and determining that she is punching the right key, the operator knows definitely that there is an error in the original card and can, accordingly, take the necessary steps to correct it. Here attention is also directed to the fact that if the original card O should happen to be double punched as sometimes occurs, two magnets 41, instead of one, would be energized and both magnets would actuate the holding pawl 70 and accordingly double lock the carriage 12. Accordingly, if the operator punching the duplicate card, sought to punch the latter correctly, even if one of the punchings in the original card was correct, the carriage still would not be released, thereby clearly indicating to the operator not only that there was still an error in the original card but that it consisted in a double punching in the column on which she was operating. Here note also that with my improved mechanism, the operator cannot double punch the duplicate card since only one key is released at a time over any column If, in the course of the punching of the duplicate card, it appears that a column should be unpunched, it will also be evident that the operator may readily effect the desired spacing by merely depressing the key S and then resuming ordinary punching on the next column; this key K acting to advance the carriage irrespective of whether all the keys K remain locked, as they would in the absence of any punching in the column through which the brushes 32 might make contact with the conducting plate 38. When the duplicate card has been completely punched, it will be evident that both the original and duplicate cards may be removed readily when the same are over the removable apertures 6, 7. Further, it will be evident that the new original and duplicate cards may be then inserted and the carriage C, then moved backward by pushing the member 19 to the right and thereby also operating the brush raising mechanism including the parts 91, 93, 94 and 37 until the carriage is again in operative relation to the brushes 32 and punches 57, whereupon the brushes 32 will again be lowered into sensing position on the first column on the new original card. The entire mechanism will then again be ready for a repetition of its cycle of operation described above.

In Figures 9, 10, and 11 I have illustrated a modified construction wherein my invention includes mechanical feeler mechanism, as distinguished from the electric brushes 32 heretofore described, while still enabling the advantages heretofore described to be obtained. Inasmuch as this structure involves only modifications in the feeler mechanism and the key controlling mechanism including the circuit connections, it is unnecessary to describe more than these and their new operation in the mechanism.

Referring more particularly to this modified structure, it will be noted that instead of brushes 32, I provide reciprocable sensing fingers or plungers 110, ten in number, and corresponding to the brushes. These fingers are adapted to move through apertures 111 corresponding to the apertures 59 heretofore described and disposed over each column in the original card O. Each of these fingers 110 is normally pressed down by a coiled spring 112 so that it will be projected thereby through any punching in the original card. Further, as shown, the upper ends of the fingers are provided with collars or heads 113 reciprocable in a casing 114 and acting to compress a coiled spring 115 in that casing, while a Bowden cable 116 is fixed to the fingers through the head 113 and extended through a suitable sheath 117. The opposite end of the Bowden cable extends through a suitable sleeve 118 disposed adjacent the free ends of the levers 54 and operates improved latch mechanism adapted to control the latter lever. Herein, it will be observed that a reciprocable latch member 119 having a latch end 120 is reciprocably mounted in the sleeve 118 and is also provided with a chamber 121 in which a light coiled spring 122 is disposed and acts against a suitable collar 123 on the end of the Bowden cable 116. Further, it will be observed that each finger 110 carries a pin 124 received in a suitable slot 125 in a lever 126 pivoted at 127 on a transverse shaft; the parts being so disposed that the spring 112 acts on the lever 126 in order to project the sensing finger down through any punching in the original card. Thus, it will be evident that whenever there is a punching in the original card, the corresponding sensing finger 110 will be projected down through this punching in such manner as, through the Bowden cable 116, to withdraw the latch 120 from beneath the corresponding lever 54 and accordingly release the corresponding key K for operation to effect punching of the duplicate card by mechanism corresponding to that heretofore described. Should, however, there be no punching in the original card and the operator attempt to depress key K, operation of this key will be prevented by the latch 120.

Cooperating with this mechanism is improved cooperating circuit controlling mechanism. Herein, it will be noted that, while the key K is returned by a spring 56 as heretofore and controls the circuit connections of the magnet and switch, the construction is quite different from that hereinbefore described. Herein, the lower end of the key K carries a cylindrical contact surface 130 which is adapted to engage with spring contacts 131 which control the circuit of a mag-

net 132 connected across the line, as shown in Figure 11. This magnet, in turn, acts upon the lever 126 as an armature. Thus, with a holding pawl 133 shown in Fig. 9 (for facility of illustration dotted in a phantom view in Fig. 10) fixed to the shaft 127 and with a key 134 likewise fixed to that shaft and movable in cut out sections 135 in the end of each lever 126, it will be evident that the sensing fingers 110 will normally tend to hold the holding pawl 133 in holding position on the rack 12 against the action of the spring 136. However, when the magnet 132 is energized, as it will be upon each depression of the key K, the lever 126 will be pulled up toward the magnet and the holding pawl 133 will be released by its spring 136. While the holding pawl 133 is thus released, the punching and carriage feeding mechanism will be operated by the key K as heretofore, the parts being returned ready for a new operation when the carriage has been advanced one tooth, i. e. ready for the feeler fingers and punches to cooperate with the next columns of the original and duplicate cards. Further, when the carriage is returned to initial position at the right, it will be evident that a pin 37, corresponding to that heretofore described and similarly operated, and operating on a swinging frame 137, will operate to hold up the sensing fingers 110 during the return movement of the carriage while releasing them for further sensing operations at the end of that movement.

Here, of course, it will also be evident that the operation of this modified mechanism will be fundamentally similar to that heretofore described save for the mechanical sensing fingers and their mechanical operation; each key K being locked and released under similar conditions to those heretofore described. Further, it will be understood that with this mechanism a space key mechanism such as that shown in Figure 8 is employed for the same purpose heretofore described.

In Figure 12 it will be noted that I have shown means for enabling the mechanism of Figures 1–8 to be used as a simple punching machine. Thus, whenever it is desired to punch only original cards on this machine, this can be done. To effect this result, I provide a square shanked plunger 140 having a head 141 acted upon by a spring 142 and normally projected thereby from a knob 143 through an aperture 144. Herein, this plunger has a key portion 145 movable into or out of the path of armature 67 for the holding pawl 70. Further, the knob 143 is knurled and provided with a pin 146 selectively engageable with any one of a series of holes 147 (herein four) in different angular positions of the knob. Thus, with this plunger pushed in and disposed between the armature 67 and the magnet 41, it would be made impossible for the holding pawl 70 to return to holding position. Accordingly, when there is no original card beneath the brushes 32, all of these brushes 32 will engage the conducting plate 38. Consequently, all of the magnets 41 then being energized, all of the keys K will be released in such manner as to permit the machine to be used as a simple punch machine. Obviously, whenever it is desired to discontinue such use, it will only be necessary to rotate the plunger until the key portion 145 is out of the path of the armature 67, whereupon the mechanism will be freely usable as a verifying punch, all as heretofore described.

In Figure 13, I have shown a modified construction adapted to be applied to the modified construction shown in Figures 9 to 11 for accomplishing the same purpose. In this figure, it will be observed that a knob 148 is provided on the shaft 127 and that this shaft is mounted for longitudinal movement with the knob and the pawl 133 and held in different longitudinal positions by grooves 149 and a spring pin 150. Thus, whenever the knob 148 is pulled out, the holding pawl 133 is disengaged from the rack 12, as shown in dotted lines in Figure 13. Accordingly, when there is no card under the sensing fingers 110, all of these will drop down in such manner as to release all of the keys 54. With all of these keys released and the carriage lock released by the knob 148, it will be evident that the machine will then be free to operate as an ordinary punch machine. Conversely, of course, whenever the knob is pushed in to bring the pawl 133 into normal position, the machine will again function as a verifying punch as heretofore described. Also, it will be understood that, while in Figure 13 the rack is shown spaced between separate casings 151 and 152 for the sensing pins and key operated mechanism, respectively, the above described mechanism may be used while still continuing to use the casing structure previously described, by simply spacing the rack further from the vertical wall between the casings.

As a result of my improved constructions, it will be evident that all need for separate verifying or comparing, after the completion of the punching of the original and duplicate cards, is eliminated, the two cards being verified during the punching of the duplicate card. Further, it will be evident that with only ordinary punching machines and my improved verifying punches, it is possible to obtain effective punching and verifying with a minimum of equipment, i. e. while eliminating the need for special verifying machines and while merely using my improved machines in lieu of half of the ordinary punching machines. It will further be clear that through the use of equipment comprising one-half ordinary punching machines and one-half my improved verifying machines, it is possible to make unnecessary the employment of girls doing only verifying work either on ordinary individual verifiers or in connection with large machines such as heretofore described. With the use of my improved machine, it is also not only possible to punch the duplicate cards and verify both cards at the same time, but also possible to punch the original cards on the same machine when desired. It will also be observed that any card acted upon by the sensing mechanism can be verified either with or without another card being simultaneously operated upon by the punches, the locking of any of the keys indicating a discrepancy between the perforation of the card being verified and the data on which it is being checked. Further, it will be evident that insofar as the verifying mechanism is concerned, the keys not agreeing with the punching of the card being verified, will be locked, irrespective of whether or not a card is being punched at the same time. Thus, under certain circumstances, where the machine is used for verifying purposes only, the punches, since they need not function, may be omitted. Also, it will be evident that when verifying, since the keys are locked upon disagreement between the cards in the machine, even if the punches are present the keys cannot be operated in such manner as to damage the card under the punches, which may be the correct card. At-

tention is also directed to the fact that my machine may be provided for use with either brushes or feeling fingers, and to the further fact that the same may also be provided with my improved attachment means for enabling either of the above forms to be adapted for use as either a verifying punch or a simple punch at will, upon merely pushing in or pulling out the attachment plunger. These and other advantages of my improved construction will, however, be clearly apparent to those skilled in the art.

While I have herein illustrated several forms which my invention may assume in practice, it will be understood that these forms are chosen for purposes of illustration and that the invention may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A verifying machine having card receiving means, and verifying mechanism having manually operable verifying keys and mechanism controlled by a card in said receiving means independently of the operation of said keys and controlling the possible manual operation of said keys.

2. A verifying machine having card receiving means, and verifying mechanism having normally locked manually operable verifying keys and key controlling mechanism controlled by a card in said receiving means and maintaining said keys locked upon disagreement between said card and a proposed manual operation of said keys.

3. A verifying machine having card receiving means, and verifying mechanism having sensing mechanism acting on the card being verified independently of the operation of said keys and manually operable verifying keys and key controlling mechanism controlled by said sensing mechanism and having means for locking said keys against manual operation not agreeing with said card.

4. A verifying machine having card receiving means, and verifying mechanism having manually operable verifying keys and mechanism controlled by a card in said receiving means having contact means acting on said card and means controlled by said contact means and controlling the possible manual operation of said keys.

5. A verifying machine having card receiving means, verifying mechanism having manually operable verifying keys and mechanism controlled by a card in said receiving means and having means for locking said keys against a proposed manual operation not agreeing with said card, and means for advancing said card while the keys are locked.

6. In a verifying machine, a plurality of card receiving means, and verifying mechanism cooperating with the cards in said means and having sensing mechanism acting on one card and manually operable verifying means cooperating with the other card and having keys and key-controlling mechanism controlled by said sensing mechanism.

7. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card, and mechanism controlled by the original card and controlling said punching mechanism during manual operation thereof.

8. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card, mechanism controlled by the original card and controlling said punching mechanism during manual operation thereof, and means for at will disabling said controlling mechanism and permitting an uncontrolled manual operation of said punching mechanism.

9. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card, and mechanism controlled by the original card and having means for inhibiting punching of the duplicate card whenever the original and proposed punchings disagree.

10. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card, and controlling mechanism including sensing means acting on the original card and means controlled by said sensing means and permitting manual operation of said punching mechanism only when the original and proposed punchings agree.

11. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card including normally locked keys, and sensing mechanism acting on the original card and unlocking said keys.

12. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card, and means requiring agreement in the punchings of said original and duplicate cards successively column by column as the duplicate card is punched.

13. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card, mechanism controlled by the original card and normally locking said punching mechanism having means for releasing the latter when the original and proposed punchings agree, and means for feeding original and duplicate cards when said punching mechanism is released or when the same is locked.

14. In a verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card having controlling means acting on the original card, and means for indicating agreement of said cards when the original and proposed punchings agree and for indicating disagreement when said punchings disagree.

15. In a verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card having controlling means acting on the original card, and feeding mechanism for feeding said cards when the original and proposed punchings agree having means for interrupting feeding when there is a duplicate punching in the original card.

16. In a verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card having controlling means acting on the original card, and feeding mechanism for feeding said cards having means for interrupting punching and feeding when the proposed punching of the duplicate card disagrees with the punching in the original card.

17. In a verifying punch machine having original and duplicate card receiving means, duplicate card punching mechanism having controlling mechanism acting on the original card and

also means for feeding said cards when the punchings therein agree and for preventing punching and feeding whenever the original and proposed punchings disagree, and means for enabling removal of the required card for correction.

18. In a verifying punching machine, punching mechanism operative on a duplicate card, and sensing mechanism operative on an original card and having means for locking said punching mechanism save when the proposed punchings in the duplicate card agree with those in the original card.

19. In a verifying punching machine, punching mechanism operative on a duplicate card, sensing mechanism operative on an original card and having means for locking said punching mechanism save when the proposed punchings in the duplicate card agree with those in the original card, and means for effecting feeding when said punching mechanism is locked.

20. In a verifying punching machine, punching mechanism operative on a duplicate card, sensing mechanism operative on an original card, locking means controlled by said sensing mechanism controlling said punching mechanism and locking said punching mechanism save when the punchings in the duplicate card agree with those in the original card, and means for rendering said sensing mechanism inoperative to control said punching mechanism.

21. A punching machine having original and duplicate card receiving means, punching mechanism for the duplicate card, means controlled by the original card for inhibiting punching whenever the original and proposed punchings disagree and permitting punching when said punchings agree, and means for at will disabling said last mentioned means to release the punching mechanism for uncontrolled manual operation.

22. In combination, card receiving means for receiving a plurality of cards, sensing mechanism acting on a card in one of said means, and cooperating punch mechanism acting on a card in the other means including a plurality of manually operated punches and controlling means therefor permitting only the operation of punches corresponding to the punching of the card acted on by said sensing mechanism.

23. In combination, card receiving means for receiving a plurality of cards, sensing mechanism including electric contact means acting on a card in one of said means, and cooperating punch mechanism acting on a card in the other means including a plurality of manually operated punches and electric controlling means therefor controlled by said contact means permitting only the operation of punches corresponding to the punching of the card acted on by said sensing mechanism.

24. A punching machine having original and duplicate card receiving means, punching mechanism for the duplicate card, means controlled by the original card and including a universal bar for inhibiting punching whenever the original and proposed punchings disagree and permitting punching when said punchings agree, and means acting on said universal bar for at will disabling said last mentioned means to release the punching mechanism for uncontrolled manual operation.

25. A punching machine having original and duplicate card receiving means, punching and feeding mechanism for the duplicate card, means controlled by the original card and including a holding pawl for inhibiting punching and feeding whenever the original and proposed punchings disagree and permitting punching when said punchings agree, and means acting on said holding pawl for at will disabling said last mentioned means to release the punching mechanism for uncontrolled manual operation.

26. In a verifying punch machine, punching mechanism including keys and locking mechanism therefor, and sensing mechanism having means for releasing said keys.

27. In a verifying punch machine, punching mechanism including keys and locking mechanism therefor, sensing mechanism having means for releasing said keys, and means controlled by the operation of said keys when released for effecting relocking of the same.

28. In a verifying punch machine, feeding mechanism including keys and locking mechanism for the latter, and sensing mechanism having means for releasing said keys.

29. In a verifying punch machine, feeding mechanism including keys and locking mechanism therefor, sensing mechanism having means for releasing said keys, and means controlled by the operation of said keys when released for effecting relocking of the same.

30. In a verifying punch machine, punching and feeding mechanism including keys and locking mechanism therefor, and sensing mechanism having means for releasing said keys.

31. In a verifying punch machine, punching and feeding mechanism including keys and locking mechanism therefor, sensing mechanism having means for releasing said keys, and means controlled by the operation of said keys when released for effecting relocking of the same.

32. In a verifying punch machine, punching mechanism including keys and locking mechanism therefor, sensing mechanism having means for releasing said keys, and means for disabling said sensing mechanism and permitting unrestricted operation of said punching mechanism.

33. In a verifying punch machine, feed operating mechanism including keys and locking mechanism therefor, sensing mechanism for releasing said keys, and card carrying means operative by said feed operating mechanism and movable relative to said sensing mechanism.

34. In a verifying punch machine, feed operating mechanism including keys and locking mechanism therefor, sensing mechanism for releasing said keys, card carrying means operative by said feed operating mechanism and movable reversely relative to said sensing mechanism, and means for rendering said sensing mechanism inoperative upon reverse movement of said card carrying means.

35. In a verifying punch machine, duplicate card punching mechanism including keys, original card sensing mechanism controlling said keys, and means for feeding both duplicate and original cards column by column relative to said mechanisms when the proposed and existing punchings of said cards agree.

36. In a verifying punch machine, duplicate card punching mechanism including keys, original card sensing mechanism controlling said keys, means for feeding both duplicate and original cards column by column relative to said mechanisms when the proposed and existing punchings of said cards agree, and means for effecting like feeding of said cards when there is

no punching in either corresponding column thereof.

37. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card comprising a plurality of punches manually operative to punch said card, and mechanism controlled by the original card and having means for inhibiting the manual operation of any other punch than that corresponding to the punching of the original card.

38. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card comprising a plurality of punches manually operative to punch said card, and mechanism controlled by the original card and having means for inhibiting manual operation of a punch corresponding to a punching in the original card when a duplicate punching appears in the same column in the latter.

39. A verifying punch machine having original and duplicate card receiving means, punching mechanism for the duplicate card comprising a plurality of punches manually operative to punch said card, and mechanism controlled by the original card and inhibiting manual operation of punches not agreeing with the punching of said original card and comprising punch locking mechanism and sensing mechanism controlling the latter.

40. A verifying punch machine having original and duplicate card receiving means, duplicate card punching mechanism, and sensing mechanism acting on the original card and controlling said punching mechanism, said sensing mechanism including electric brushes and said punching mechanism having controlling mechanism therefor in circuit with said brushes.

41. A verifying punch machine having original and duplicate card receiving means, duplicate card punching mechanism, and sensing mechanism acting on the original card and controlling said punching mechanism, said sensing mechanism comprising fingers projectible through punchings in the original card and said punching mechanism including controlling mechanism for the latter controlled by said fingers.

42. A verifying punch machine having original and duplicate card receiving means, duplicate card punching mechanism, and sensing mechanism acting on the original card and controlling said punching mechanism, said sensing mechanism comprising fingers projectible through punchings in the original card, and locking mechanism for said punching mechanism controlled by said fingers and locked when the original and proposed punchings disagree and released when said punchings agree.

43. In a verifying punch machine, a feed bed having original and duplicate card feeding mechanism, and sensing and punching mechanisms operative respectively on original and duplicate cards therein and having means for enabling punching and effecting feeding of said mechanism when the proposed punching in the duplicate card corresponds to the existing punching in the original card.

44. In a verifying punch machine, a feed bed having original and duplicate card feeding mechanism, and sensing and punching mechanisms operative on original and duplicate cards therein and having means for punching a duplicate card and effecting feeding of said mechanism only when the original and proposed punchings agree, said sensing and punching mechanisms being respectively disposed over the original and duplicate cards and having said feeding mechanism moving beneath the same.

45. In a verifying punch machine, a carriage having means for carrying duplicate and original cards, cooperating punching and sensing means acting upon duplicate and original cards on said carriage, controlling means controlled by said sensing means for permitting punching and effecting feeding of the carriage in one direction only, when the original and proposed punchings agree, means for effecting a reverse movement of said carriage, and means for rendering said punching, sensing and controlling means inoperative during said reverse movement.

46. In a verifying punch machine, a carriage, cooperating punching and sensing means acting upon original and duplicate cards on said carriage and effecting feeding of the latter in one direction, means for effecting a reverse movement of said carriage, and mechanism for rendering said sensing mechanism inoperative during said reverse movement and restoring the same to operative position upon completion of said reverse movement including reciprocating means operative as said carriage moves reversely, swinging means automatically swung thereby, and elevating means for said sensing means operative by said swinging means.

47. In a verifying punch, a key operated lever, a card carriage, means operated by said lever for punching a card in said carriage and feeding the latter, and means for locking said lever upon release thereof.

48. In a verifying punch, a key operated lever, a card carriage, means operated by said lever for punching a card in said carriage and feeding the latter, and locking means for said lever releasable to permit movement thereof and relock it upon lever movement.

49. In a verifying punch, a key operated lever, a card carriage, means operated by said lever for punching a card in said carriage and feeding the latter, and locking means for said lever releasable to permit movement thereof and relock it upon lever movement, said locking means including a magnet controlling said lever and a magnet controlling switch controlled by said lever.

50. In a verifying punch, a key operated lever, a card carriage, and means operated by said lever for punching a card in said carriage and feeding the latter, said feeding mechanism including escapement mechanism operative as said lever moves to effect punch operation.

51. In a verifying punch, a key operated lever, a card carriage, and means operated by said lever for punching a card in said carriage and feeding the latter, said feeding mechanism including escapement mechanism operative to center the card beneath said punch prior to punching and to feed said card following punching.

52. In a verifying punch, a key operated lever, a card carriage, and means operated by said lever for punching a card in said carriage and feeding the latter, said feeding mechanism including an escapement operative to effect feeding movements before and after the operation of said punch.

53. In a verifying punch, a key operated lever, a card carriage, means operated by said lever for punching a card in said carriage and feeding the latter, locking mechanism for said lever, and feed holding means controlled by said locking means and lever.

54. In a verifying punch, punching mechanism including a key operated lever, latching means controlling the operation of said lever, and electro-responsive means controlling said latching means.

55. In a verifying punch, punching mechanism including a key operated lever, latching means controlling the operation of said lever, electro-responsive means controlling said latching means, and sensing means controlling said electro-responsive means.

56. In a verifying punch, a key operated lever, normally operative latching mechanism therefor, a magnet controlling said latching mechanism, and a switch operative upon operation of said lever and controlling said magnet.

57. In a verifying punch, a key operated lever, normally operative latching mechanism therefor, a magnet releasing said latching mechanism, and a switch operative upon operation of said lever and deenergizing said magnet.

58. In a punch, a key operated lever, feeding mechanism including an escapement pawl and operated by said lever, and punching mechanism including a punch likewise operated thereby and disposed between said escapement pawl and the lever pivot.

59. In a punch, a key operated lever, feeding mechanism including an escapement pawl operated thereby, punching mechanism including a punch likewise operated thereby, and normally operative locking mechanism controlling said lever and associated with the free end thereof.

60. In a verifying punch, a key operated lever, a card carriage, means operated by said lever for punching a card in said carriage and feeding the latter, latching mechanism for said lever, and sensing mechanism controlling the operation of said latching mechanism.

61. In a verifying punch, a key operated lever, a card carriage, means operated by said lever for punching a card in said carriage and feeding the latter, latching mechanism for said lever including a Bowden wire, and sensing mechanism controlling the operation of said latching mechanism including a feeler movable with said wire.

62. In a verifying punch, a key operated lever, a card carriage, means operated by said lever for punching a card in said carriage and feeding the latter, latching mechanism for said lever including a Bowden wire, sensing mechanism controlling the operation of said latching mechanism including a feeler movable with said wire, and electro-responsive means controlling said feeler.

63. In a verifying punch, a key operated lever, a card carriage, means operated by said lever for punching a card in said carriage and feeding the latter, latching mechanism for said lever including a Bowden wire, sensing mechanism controlling the operation of said latching mechanism including a feeler movable with said wire, electro-responsive means controlling said feeler, and switching mechanism operative with said lever and controlling said electro-responsive means.

64. In a punching mechanism, a key, a card carriage having means for carrying original and duplicate cards, cooperating punching and sensing mechanisms including a punch operative on the duplicate card by said key and sensing means operative on the original card controlling the operation of said punch and releasing the same for manual operation when the original and proposed punchings agree, and means operative by said key to effect a feeding movement of said carriage.

65. In a punching mechanism, a key operated lever, a card carriage, means operative by said lever to effect a feeding movement of said carriage, said key operated lever including a depressible key and a lever extending transversely of said key and movable therewith, means normally maintaining said key and lever in elevated position, and cooperating controlling mechanism for said carriage and key including locking means controlling said lever and a switch controlled by said key.

WALTER K. YOUNGBERG.