Jan. 22, 1935. W. K. YOUNGBERG 1,989,049

CARD HANDLING MECHANISM

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Fig. 1.

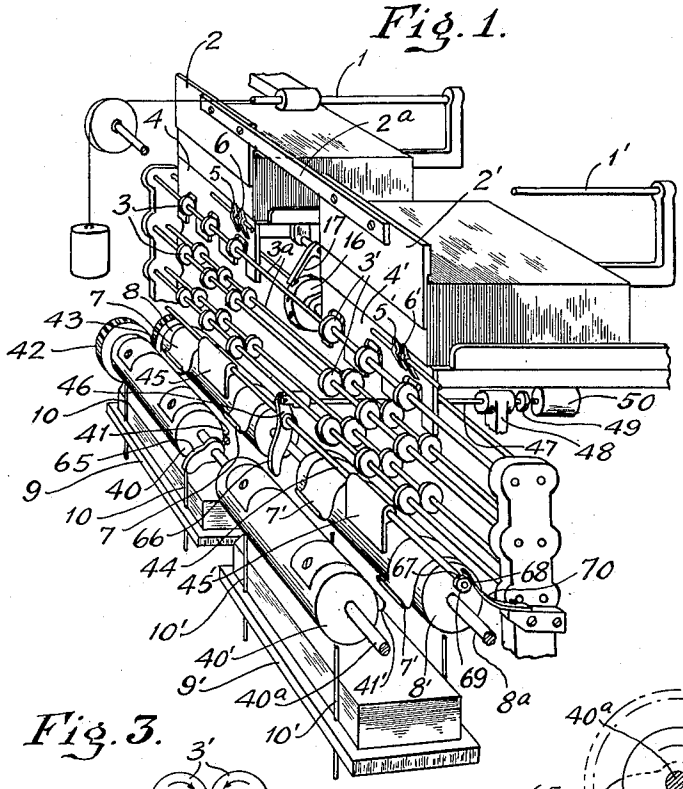


Fig. 2.

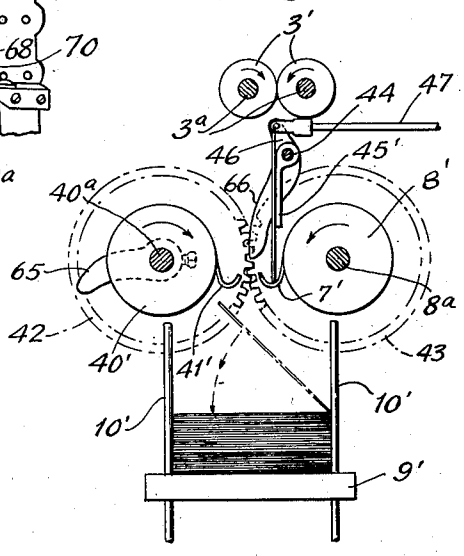


Fig. 3.

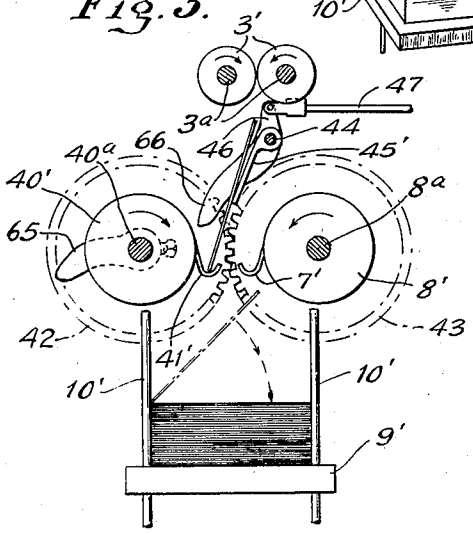
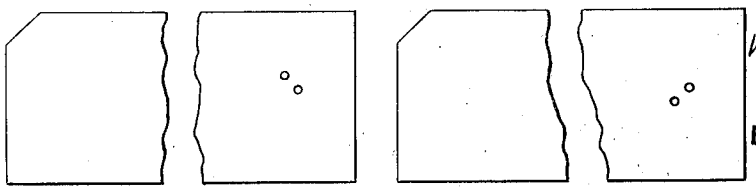


Fig. 6.



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Fig. 4.

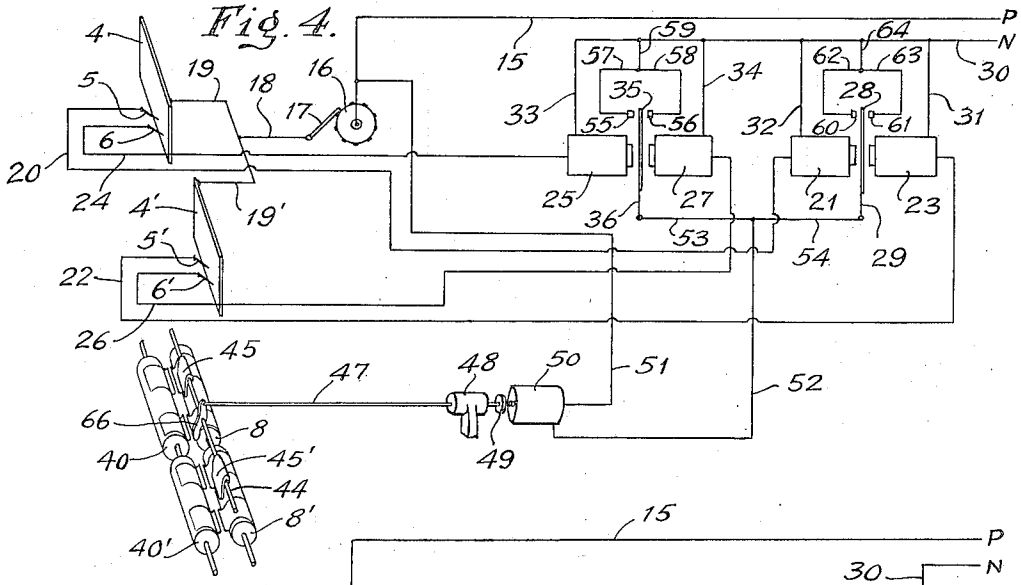


Fig. 5.

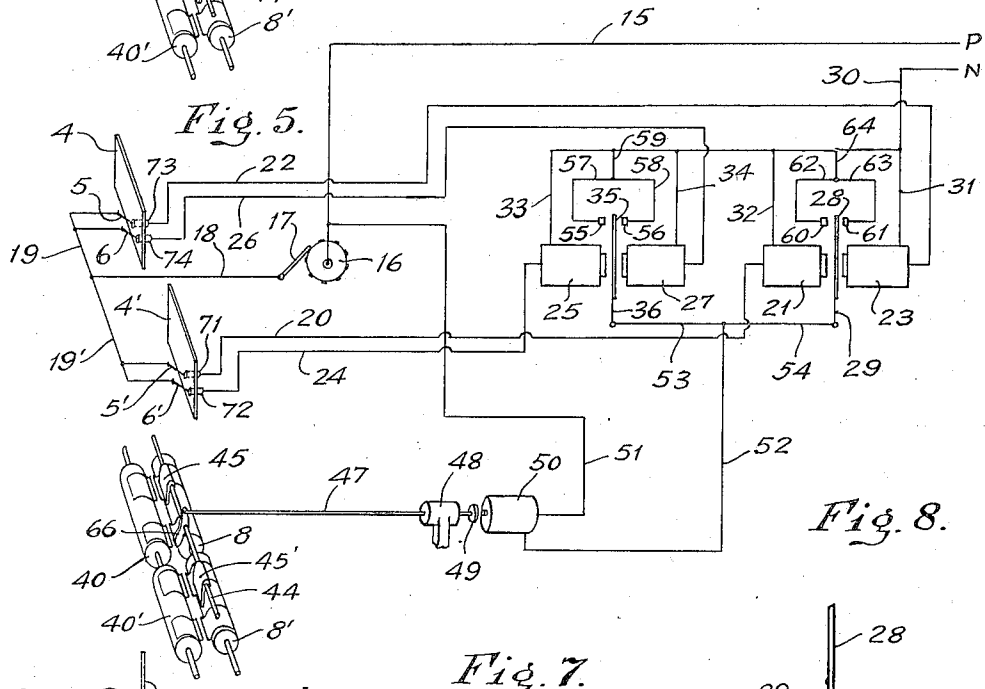


Fig. 8.

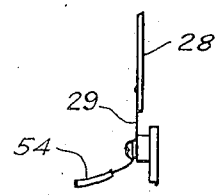
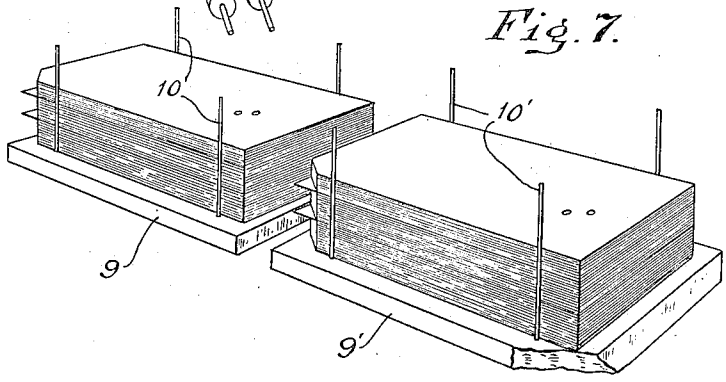


Fig. 7.



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1,989,049

CARD HANDLING MECHANISM

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Application August 13, 1929, Serial No. 385,650

29 Claims. (Cl. 209—110)

My invention relates to card handling mechanisms.

In duplicate card systems used in connection with tabulating machines, such frequent errors are made by the operators punching the cards that it has become the practice to employ a checker to compare the cards. As a result, since there is a substantial amount of time required in the comparing process and one checker is ordinarily required for each two punch operators, the force required is consequently larger than if such comparing was unnecessary, while in the nature of things, with a properly trained force, the large majority of the time required for comparing is wasted, since all but a relatively small proportion of the cards are correct. Further, even after comparing, a considerable number of errors remain, resulting in delay, confusion and difficulty in locating and separating the incorrect cards from the correct cards in the thousands of cards constituting the results of a day's work.

My invention has for its object to provide an improved mechanism making the manual comparing operation unnecessary and adapted to receive the two identical sets of similarly punched cards direct from the punch operators and before the same are delivered to the other units of the tabulating system, and such an improved mechanism which is adapted to operate continuously and simultaneously upon the two sets of cards in the same manner and render readily available both cards of all pairs of cards in which an error appears in one card or the other of the pair, all the while passing both sets of cards uninterruptedly through the machine, all in such manner as substantially to reduce the number of employees required and speed up the work.

More particularly, my invention has for its object to provide an improved mechanism adapted to use in connection with such duplicate card systems whereby any error in the punching of any supposedly corresponding pair of cards is automatically detected. A further object of my invention is to provide such an improved mechanism adapted automatically to indicate in the same manner both of any incorrectly punched pair of cards so that they may be readily removed as a pair and corrected. A still further object of my invention is to provide such an improved mechanism operating continuously on two supplies of cards, one the master cards and the other the set of cards supposed to correspond exactly therewith, and wherein both of the cards in any pair in which an error occurs, are automatically stacked reversely with respect to the correct cards passing through the mechanism, so that the incorrectly punched pairs of cards prominently appear in the stacks of cards in such manner as to enable them to be quickly located, removed and corrected. Other objects of my invention are to provide improved mechanism for accomplishing the above results which is also adapted to be driven by the usual driving mechanism of a tabulating machine, and which is further adapted to utilize numerous mechanisms of such a machine. These and other objects and advantages of my improved construction will, however, hereafter more fully appear.

In the accompanying drawings, I have shown, for purposes of illustration, one embodiment which my invention may assume in practice.

In these drawings:—

Figure 1 is a perspective view of my improved mechanism, the driving connections usual in tabulating machines being omitted to facilitate illustration.

Figure 2 is an enlarged detail view showing the card reversing mechanism in the process of depositing a correct card in its usual position.

Fig. 3 is a similar view showing this mechanism in the process of reversing an incorrectly punched card;

Fig. 4 is a wiring diagram showing one form of circuit connections which may be used;

Fig. 5 is a wiring diagram showing modified connections to the brushes rather than the plates which may be used if desired;

Fig. 6 is a plan view of the cards used, the left hand card being the master card and correctly punched while the other card is incorrectly punched;

Fig. 7 is an enlarged perspective view of the stacks showing the reversed cards projecting therefrom; and

Fig. 8 is a detail view of the armature mounting for one of the sets of electromagnets.

In this illustrative embodiment, I have shown my invention as applied to a tabulating machine of the Powers type and embodying numerous well known mechanisms in such a machine. Herein, these mechanisms include a feeding mechanism 1 having a usual table and a cooperating weight operated feeding means feeding laterally the supply of cards to be passed through the mechanism, and a vertically reciprocable member 2 at one end of the table adapted to feed individual cards vertically downward from the table. Usual sets of feeding rolls 3 also receive the cards from the member 2. Further, a usual vertical and stationary conducting plate 4 is provided beneath one

end of the table, past which the perforated cards are fed while a plurality of usual brushes, herein for illustrative purposes two and shown at 5 and 6, is provided to sweep across the cards and engage with the plate 4 through the punched holes. Usual turning clips 7 carried on a roll 8 are also disposed beneath the rolls 3 and adapted to turn the cards from the vertical position, in which they pass from the rolls 3 to these clips, into a horizontal position on a usual support 9 carried on spring means (not shown), the cards being stacked as usual in a vertical stack inside usual guards 10 near the corners of the cards.

In considering my improved mechanism, it will first be noted that, whereas in a usual tabulating machine of this type one such mechanism is used, in my improved construction, I provide a plurality of these mechanisms synchronously connected and operated and one operating on each set of cards. Further, while in the usual machine of this type, the brushes and conducting plates cooperate to energize totalizing mechanism totalling the amounts indicated by the various punches in the cards, I provide improved mechanism, operative when the punching of the two cards does not agree, to indicate this error and cause both of those cards to be automatically reversely stacked in the guards 10, and thereby, instead of producing a smooth stack in which the usual clipped corners are all together, cause the unclipped corners of the incorrect set of cards to project beyond the clipped corners of the correct cards in such manner as prominently to indicate the incorrect cards and also make them readily removable from the final stack.

More particularly considering the mechanism, it will be noted that I have herein illustrated as 1' to 10' a second set of elements corresponding to the elements 1 to 10 previously mentioned, and that I have shown this second set disposed parallel to the first set. With the exception of the mechanisms 1 and 1', which, while not necessarily so, are herein independent, I have also shown each element of the second set so connected to the first set as to be operated synchronously therewith and accordingly driven thereby from the usual driving mechanism of the first set (not shown). For example, the elements 2 and 2' are herein connected by a bridging member 2^a so as to move together, while the several sets of rollers 3 and 3' are similarly connected by shafts 3^a, and the two members 8 and 8' are similarly connected by a shaft 8^a. Thus, it will be noted that it is impossible for the two sets of mechanisms to get out of step when once started together and operating upon properly arranged sets of cards carried by the tables.

Associated with both mechanisms, I have also provided improved error detecting mechanism including improved circuit connections and shown, for example, in Fig. 4. There it will be noted that as usual in the prior machines mentioned, the line connections, indicated at P and N, have their positive lead 15 connected to a usual timer switch 16 which is as usual divided into a number of divisions corresponding to the maximum number of horizontal rows for punching provided on the cards. Herein, it will also be noted that I have for simplicity of illustration, shown only two brushes in each set, namely, 5, 6 and 5', 6', but it will be understood that in practice, the number of brushes provided will correspond to the number of vertical rows on the cards. Attention is here also directed to the fact that this timer is connected as usual through a brush 17 and conductor 18 to conductors 19 and 19' which are in turn connected to the plates 4 and 4'. Thus, when any brush, as 5 or 5', or 6 or 6', which sweeps over the cards supplied between the brush and the plate, fails to move through the punched hole in its card at the same time that its companion brush moves through the supposedly corresponding hole in the other card, current will only flow from the plate through one of the brushes, the other brush then being kept from completing the circuit by the intervening unpunched portion of the card. In other words, if the corresponding cards are correctly punched, current will be transmitted simultaneously through both brushes of the same set, whereas, if the punch is where it ought not to be in either card, the brush sweeping over that card will transmit current from the plate at a different time as compared with its companion brush operating upon the companion card.

In my improved mechanism, I provide associated indicating mechanism controlled by these unsynchronized contacts. More particularly, it will be noted that the brush 5 is connected through a conductor 20 with an electromagnet 21, while the brush 5' is connected through a conductor 22 with an electromagnet 23, and that the brush 6 is connected through a conductor 24 with an electromagnet 25, while the brush 6' is connected through a conductor 26 with an electromagnet 27. Further, it will be noted that the magnets 21 and 23 are disposed adjacent and on opposite sides of an armature 28 resiliently mounted at 29 and adapted to be attracted by either magnet 21 or magnet 23, depending upon whether the brush 5 or 5' engages with its plate, it being noted that current flow through the magnet 23 is provided to the negative line lead 30 by a conductor 31 while the magnet 21 is similarly connected to the conductor 30 by a conductor 32. Attention is also directed to the fact that the magnets 25 and 27 are similarly connected to the lead 30 by conductors 33 and 34 and that a similar armature 35 is provided between these magnets and resiliently mounted at 36. Thus, it will be evident that when the brushes of any supposedly corresponding pair simultaneously engage their plate, the electromagnets of that set will be simultaneously energized in such manner as to balance one another and thus to have no effect upon their armature, whereas, if one brush establishes a current flow from the plate and the other brush does not, as when its card is not properly punched, only one magnet will be energized and an unbalanced effect will be produced causing the armature to move toward the energized magnet. Thus, it will be evident that, assuming for purposes of illustration that there are only two rows of vertical punchings on each card as in the illustrative construction, and that corresponding rows on different cards are swept over by the brushes 5 and 5' while the other corresponding rows on the cards are swept over by the brushes 6 and 6', one set of magnets 21 and 23 will be unbalanced and swing its armature to one side or the other when an error exists in one set of rows, while similarly the other set of magnets 25, 27 will be unbalanced and swing its armature 35 when an error exists in the other set of rows. Similarly, it will be evident that if there are, for example, forty-five vertical rows on the cards, there will be forty-five brushes operating on each plate, and forty-five sets of magnets.

While the movements of the armatures 28 and 35 thus indicate whether or not the cards are

correct, I prefer not to rely upon this and not to interrupt the operation of the mechanism in order to enable correction to be made. Instead, I provide further automatic mechanism which, while enabling continuous operation, stacks the incorrectly punched cards differently from the correct cards. Herein, this mechanism includes a set of rolls 40, 40', corresponding to the rolls 8, 8' and likewise mounted on a common shaft 40^a and disposed parallel and opposite the rolls 8, 8', previously described. These rolls 40, 40' also carry clips 41, 41', corresponding to the clips 7, 7', but reversely disposed. Moreover, I connect the common shafts 40^a and 8^a of these two sets of rolls by gearing 42, 43 so that the rolls and clips are rotated in opposite directions, the rolls 8, 8' rotating counter-clockwise while the rolls 40, 40' rotate clockwise. Moreover, I suitably journal a shaft 44 above the rolls 8 and 8' and provide on this shaft deflectors 45, 45' adapted to deflect the cards delivered by the rolls 3, 3' into either the clips 7, 7' or 41, 41'. Herein, I also provide a crank 46 midway between the ends of the shaft 44, and pivotally connect this to a suitable reciprocable rod 47 movable in a bearing 48 on the frame and having its end 49 forming the armature of a magnet 50 of suitable size. This magnet 50 in turn is connected by a conductor 51 with the positive line lead 15 at a point on the line side of the timer 16, while it is also connected by a conductor 52 to conductors 53 and 54, which are respectively connected to the fixed ends of the armatures 35 and 28. Attention is also directed to the fact that these armatures 35 and 28 are each adapted to close the circuit of the magnet 50 when moved by their own magnets, the armature 35 herein being adapted to engage a contact 55 or a contact 56, respectively connected through conductors 57 and 58 to a conductor 59 connected to the negative lead 30, while the armature 28 similarly engages contacts 60 or 61 connected through conductors 62, 63 with a conductor 64 connected to the same lead 30. Thus, it will be evident that with the deflectors 45, 45' normally occupying the position shown in full lines in Fig. 2 when the magnet 50 is not energized, i. e. when the cards are correct, these correct cards will pass from between the rolls 3 into the clips 7, 7' in such manner that the latter clips, moving in a counter-clockwise direction will move their lower edges to the right and place them on the supports 9, 9', with their clipped corners all at one corner of the support and the cards vertically stacked correctly inside the guards 10, 10'. Should, however, incorrect cards be detected by the brushes of any set, the set of electromagnets 21, 23 or 25, 27 associated with the vertical division of the card in which the error appears, will be unbalanced in such manner as to establish a current flow from the line through the magnet 50, the conductors 52, 53 or 54, the armature of the set affected, and back to the line through the contacts 55 or 56 or 60 or 61, etc., thereby resulting in energizing the magnet 50. When this occurs, its armature 49 will be drawn toward it, together with the rod 47 in such manner as to throw the crank arm 46 and consequently throw the deflectors 45, 45' from the full line position shown in Fig. 2 to the full line position shown in Fig. 3 and consequently deflect in a similar manner both of the cards of the pair including the improperly punched card or cards from the clips 7, 7' to the clips 41, 41'. Further, these latter clips rotating in a clockwise direction, the lower edges of these incorrectly punched cards will be lowered and deflected to the left in such manner as to bring them, not at the right of the stack, as is true of the correct cards, but to the left thereof and thereby make their unclipped corners project from the clipped corners of the correct cards. Thus, it will be evident that whenever an improperly punched pair of cards passes through the mechanism, the error will be automatically detected and both cards of the incorrect pair of cards automatically turned so that they may be readily detected and removed from the stack for correction.

Associated with this mechanism, I preferably also provide improved re-setting mechanism in the form of a cam 65 on the shaft 40^a, herein disposed on the opposite side from the clips 41, 41' and adapted to engage a depending lug 66 on the crank 46 as the shaft 40^a rotates. Thus, it will be noted that due to the location of the cam 65 relative to the clips 41, 41', the deflectors 7 and 7' will be returned to their full line position in ample time to permit the next card, if a correct card, to be delivered into the clips 7, 7' and properly stacked by the clips 7, 7'. Attention is moreover directed to the holding means provided to insure proper positioning of the deflector and including a plurality of adjustable angularly disposed flat portions 67, 68 provided on a member 69 carried on the shaft 44, herein at one end thereof, and engageable by a flat spring 70 carried on the frame and acting to hold the shaft and deflector definitely in either position while being releasable whenever the magnet 50 or cam 65 rotates the shaft.

In Fig. 5 I have illustrated a modified form of circuit connection which may be used if desired. In this arrangement it will be noted that instead of the timer 16 being connected to the plates, the timer is connected to the brushes, while instead of the brushes being connected to the magnets 21, 23 and 25, 27, new contacts in the plates 4 and 4' are connected to these magnets. Referring more particularly to the figure, it will be noted that the brush 17 of the timer is here connected to a conductor 18 which is in turn connected through conductors 19 and 19' connected to the brushes 5, 6 and 5', 6', respectively, while the conductors 20 and 24 and 22 and 26 are connected respectively between insulated contacts 71, 72 and 73, 74 in the plates 4' and 4 and the magnets 21, 25 and 23, 27. Obviously, although in this arrangement insulating plates may be utilized and the circuit connections will be as above, the rest of the connections and structure will be the same as previously described.

It should be noted that in the operation of the machine, whether the cards of a pair are normally stacked or reversely stacked, the machine always acts on both cards of the pair in the same manner, the paired relationship of the cards of the sets not only being preserved but the position of the pairs being unchanged in the stacks after the comparing operations except for the occasional reversal of both cards of a pair found to be dissimilar as to punching.

The advantages of keeping each of a pair of cards in separate stacks and in the same order in their respective stacks will be evident. This eliminates the operation of uniting the cards of the duplicate sets into a single stack and subsequently separating them, as required to perform any comparing operation on the cards in existing tabulating machines which feed the cards from a single stack to the comparing station. The present machine not only saves these uniting and

separating operations but, due to the fact that the cards are fed simultaneously from two stacks, my machine can compare twice as many cards in a given time as compared with existing machines which feed the pairs successively from a single stack, without exceeding the rather definite linear speed beyond which it is not practical to feed the cards past the brushes. Thus my machine is especially adapted to use in comparing the cards as they come directly from the punch operators while still in the punching department. Also, one machine of the type herein disclosed will release for other use two tabulating machines while also insuring that all cards leaving a very large punching department are correct as to punching before they are placed in circulation.

While I have in this application specifically described one embodiment which my invention may assume in practice together with one possible modification thereof, it will be understood that the showing in this application is for illustrative purposes and that my invention may be modified and embodied in various forms irrespective of the particular circuit connections or in certain embodiments without limitation to electrical connections and it will further be understood that it is my intention to cover all such modifications within the scope of the appended claims.

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

1. In a card comparing mechanism, feeding and comparing mechanisms simultaneously operating upon different sets of cards of supposedly duplicate sets of cards, and means receiving cards therefrom for reversely stacking correct and incorrect pairs of cards.

2. In a card comparing mechanism, a plurality of duplicate card feeding mechanisms connected for synchronous operation and each operable only on a single card of each pair of cards having means for simultaneously advancing each pair of cards past a comparing station, and means for automatically detecting any dissimilarity in each pair of cards simultaneously passing therethrough and indicating both cards of any dissimilar pair.

3. In a card comparing mechanism, duplicate card feeding mechanism connected for synchronous operation, and means for automatically detecting any dissimilarities in each pair of cards passing therethrough and indicating both cards of said pair operative without interruption of synchronous operation and having different sets of brushes co-operating only with different cards of each pair.

4. In a card comparing mechanism, a plurality of duplicate card feeding mechanisms connected for synchronous operation and each operable only on a single card of each pair of cards having means for simultaneously advancing each pair of cards past a comparing station, and means for automatically detecting any dissimilarity in each pair of cards simultaneously passing therethrough having automatically operative indicator mechanism indicating both cards of any dissimilar pair and operative while said feeding mechanisms continue to operate.

5. In a card comparing mechanism, a plurality of duplicate card feeding mechanisms connected for synchronous operation and each operable only on a single card of each pair of cards having means for simultaneously advancing each pair of cards past a comparing station, means for automatically detecting any dissimilarity in each pair of cards simultaneously passing therethrough, and card stacking mechanism receiving cards from said feeding mechanisms indicating both cards of each incorrect pair and controlled by said detecting means.

6. In a card comparing mechanism, a plurality of duplicate card feeding mechanisms connected for synchronous operation and each operable only on a single card of each pair of cards having means for simultaneously advancing each pair of cards past a comparing station, means for automatically detecting any dissimilarity in each pair of cards simultaneously passing therethrough, and cooperating means receiving cards from said feeding mechanisms and controlled by said detecting means for differently handling correct and incorrect pairs of cards while indicating both cards of any incorrect pair of cards.

7. In a card comparing mechanism, duplicate card feeding mechanisms connected for synchronous operation, means for automatically detecting dissimilarities in any pair of cards passing therethrough, and cooperating means receiving cards from said feeding mechanisms and controlled by said detector mechanism for reversely stacking correct and incorrect cards.

8. In a card comparing mechanism, a plurality of simultaneously operative duplicate card feeding mechanisms having means for simultaneously advancing each pair of cards past a comparing station, error detector mechanism simultaneously acting upon the different cards of supposedly duplicate cards fed thereto by different feeding mechanisms, and indicator mechanism connected to said detector mechanism and differently actuated thereby for correct and incorrect cards indicating both cards of each incorrect pair.

9. In a card comparing mechanism, a plurality of simultaneously operative duplicate card feeding mechanisms having means for simultaneously advancing each pair of cards past a comparing station, error detector mechanism simultaneously acting upon the different cards of supposedly duplicate cards fed thereto by different feeding mechanisms, and error indicating means other than said feeding mechanisms including normally inoperative means controlled by said detector mechanism and indicating both cards of each incorrect pair.

10. In a card comparing mechanism, a plurality of simultaneously operative duplicate card feeding mechanisms having means for simultaneously advancing each pair of cards past a comparing station, error detector mechanism simultaneously acting upon the different cards of supposedly duplicate cards fed thereto by different feeding mechanisms, and card handling mechanism receiving cards from said feeding mechanisms including normally inoperative means controlled by said detector mechanism and separating out both cards of any incorrect pair.

11. In a card comparing mechanism, a plurality of simultaneously operative duplicate card feeding mechanisms, contact mechanism including a plurality of brushes simultaneously sweeping over the different cards of supposedly duplicate cards fed thereto by different feeding mechanisms, and indicator means other than said feeding mechanisms having coils controlled by said brushes and differently actuated by said coils for corresponding and non-corresponding pairs of cards.

12. In a card comparing mechanism, a plurality of simultaneously operative duplicate card feeding mechanisms, contact mechanism includ-

ing a plurality of brushes simultaneously sweeping over the cards fed by different mechanisms, and mechanisms connected to said brushes and differently actuated for corresponding and non-corresponding pairs of cards including normally balanced oppositely acting coils and controlling means operative when said coils are unbalanced.

13. In a card comparing mechanism, a plurality of simultaneously operative duplicate card feeding mechanisms having means for simultaneously advancing each pair of cards past a comparing station, contact mechanism including a plurality of brushes simultaneously sweeping over the different cards of supposedly duplicate cards fed thereto by different feeding mechanisms, control mechanisms controlled by said brushes and differently actuated for corresponding and non-corresponding pairs of cards, and card handling mechanism other than said feeding mechanisms controlled by said control mechanisms.

14. In a card comparing mechanism, a plurality of simultaneously operative duplicate card feeding mechanisms having means for simultaneously advancing each pair of cards past a comparing station, contact mechanism including a plurality of brushes simultaneously sweeping over the different cards of supposedly duplicate cards fed thereto by different feeding mechanisms, detector mechanisms connected to said brushes and differently energized for corresponding and non-corresponding pairs of cards, and card stacking mechanism controlled by said detector mechanism and differently stacking corresponding and non-corresponding pairs of cards.

15. In a card comprising mechanism, simultaneously operative duplicate card feeding mechanisms, contact mechanisms for each of the same having a plurality of brushes simultaneously sweeping over punched cards fed thereby, a plurality of card handling mechanisms simultaneously receiving the fed cards, and controlling means selectively operating said handling mechanisms and controlled by corresponding brushes in each set of the latter.

16. In a card comparing mechanism, simultaneously operative duplicate card feeding mechanisms, contact mechanisms for each of the same having a plurality of brushes simultaneously sweeping over punched cards fed thereby, a plurality of card handling mechanisms simultaneously receiving the fed cards, and controlling means selectively operating said handling mechanisms and controlled by corresponding brushes in each set of the latter and including a set of controlling magnets for each pair of brushes.

17. In a card comparing mechanism, simultaneously operative duplicate card feeding mechanisms, contact mechanisms for each of the same having a plurality of brushes simultaneously sweeping over punched cards fed thereby, a plurality of card handling mechanisms simultaneously receiving the fed cards, and controlling means selectively operating said handling mechanisms and controlled by corresponding brushes in each set of the latter and including a set of controlling magnets for each pair of brushes, and contact mechanism controlled by said magnets.

18. In a card comparing mechanism, simultaneously operative duplicate card feeding mechanisms, contact mechanisms for each of the same having a plurality of brushes simultaneously sweeping over punched cards fed thereby, a plurality of card handling mechanisms simultaneously receiving the fed cards, and controlling means selectively operating said handling mechanisms and controlled by corresponding brushes in each set of the latter and including a set of controlling magnets for each pair of brushes, a magnet controlling said handling mechanisms, and contact mechanism controlling said last mentioned magnet and controlled by each set of said sets of magnets.

19. In a card comparing mechanism, a plurality of duplicate card feeding mechanisms each feeding only a different card of each pair, operative connections therebetween requiring synchronous operation thereof, and a plurality of co-operating error detector mechanisms indicating both cards of each dissimilar pair operative while synchronous operation continues and having one of said mechanisms associated with each feeding mechanism and each operating only on a different card of each pair.

20. In a card comparing mechanism, a plurality of duplicate card feeding mechanisms each feeding only a different card of each pair, operative connections therebetween requiring synchronous operation thereof, and a plurality of co-operating error detector mechanisms indicating both cards of any dissimilar pair operable at each time while synchronous operation continues and having one of said mechanisms associated with each feeding mechanism and each operating only on a different card of each pair, each of said detector mechanisms having a single set of brushes sweeping only over the various columns on its own card.

21. In a card comparing mechanism, a plurality of duplicate card feeding mechanisms having means for simultaneously advancing each pair of cards past a comparing station and each feeding a different set of supposedly duplicate cards, operative connections therebetween requiring synchronous operation thereof, and a plurality of error detector mechanisms synchronously operating on a plurality of columns on different cards of each pair of cards fed by said duplicate mechanisms and having indicating means operative upon dissimilarity in the punching of any of said columns in either of said cards to indicate both of said cards.

22. In a card comparing mechanism, a plurality of duplicate card feeding mechanisms, operative connections therebetween requiring synchronous operation thereof, and a plurality of error detector mechanisms synchronously operating on a plurality of columns on a different card of each pair of cards and having card stacking means controlled by said detector mechanisms and stacking corresponding cards in one manner and reversely stacking non-corresponding cards.

23. Mechanism for feeding and comparing supposedly duplicate sets of cards having means for continuously feeding and comparing, irrespective of the records thereon, both cards of each pair of supposedly duplicate cards while advancing them past a comparing station in separate paths, and mechanism receiving the cards from said comparing means having means responsive to said comparing means for sorting out both cards of each non-duplicate pair.

24. Mechanism for feeding and comparing supposedly duplicate sets of cards comprising a plurality of sets of feeding and comparing mechanisms each operating only on a different set of cards and simultaneously advancing each supposedly duplicate pair past a comparing station, and mechanism receiving cards from said comparing mechanism including indicating means re-

sponsive to said comparing mechanism for indicating both cards of each non-duplicate pair.

25. In a card comparing mechanism, a plurality of continuously operating feeding mechanisms simultaneously operating upon different sets of supposedly duplicate cards having means for simultaneously advancing each pair of cards past a comparing station, and error detector mechanism synchronously operating on the different cards of each pair of cards passing therethrough and having means for indicating both cards of each non-matched pair.

26. In a card comparing mechanism, a plurality of feeding mechanisms simultaneously operating upon different sets of supposedly duplicate cards having means for simultaneously advancing each pair of cards past a comparing station, and error detector mechanism synchronously operating on different cards of each pair of cards passing therethrough and having different sets of detector means and different sets of card handling means other than said feeding mechanisms operative only on different cards of each pair, and automatically operable by said detector means to indicate both cards of each non-matched pair.

27. In a card comparing mechanism, a plurality of sets of feeding and comparing mechanisms each operative only on a different card and both simultaneously operating upon the different cards of supposedly duplicate sets of cards, and means controlled by the comparing mechanisms thereof receiving cards from the feeding mechanism thereof and operative on both cards of each pair after being compared for differently stacking the correct and incorrect pairs of cards.

28. Mechanism for feeding and comparing supposedly duplicate sets of cards having means for feeding and comparing the sets of cards while maintaining the same in separate groups including means for simultaneously advancing each pair of cards past a comparing station, and means for indicating both cards of any non-duplicate pair while said feeding and comparing means continues to operate.

29. Mechanism for feeding and comparing supposedly duplicate stacks of cards having means for continuously feeding and comparing both cards of each pair of supposedly duplicate cards while maintaining them in separate paths and advancing them past a comparing station, and mechanism receiving the cards from said comparing means having means responsive to said comparing means for sorting out both cards of each non-duplicate pair while maintaining each in its own stack.

WALTER K. YOUNGBERG.

CERTIFICATE OF CORRECTION.

Patent No. 1,989,049. January 22, 1935.

WALTER K. YOUNGBERG.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 5, first column, line 36, claim 15, for "comprising" read comparing; second column, line 26, claim 20, for "any" read each and for "each" read any; page 6, second column, line 4, claim 27, for "mechanism" read mechanisms; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of March, A. D. 1935.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.