June 2, 1942. L. G. TOWNSEND 2,284,694

PHONETIC VERIFIER

Filed June 17, 1938 5 Sheets-Sheet 1

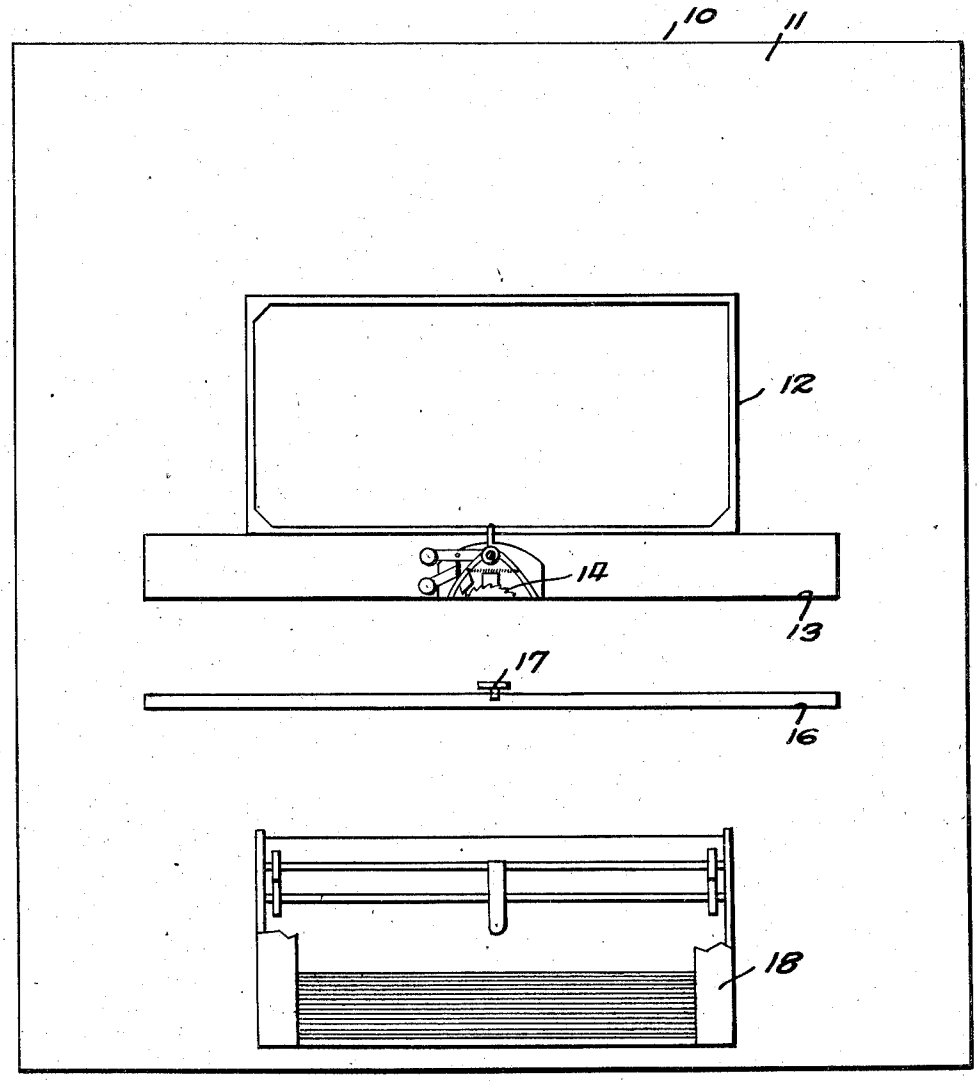


Fig. 1.

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PHONETIC VERIFIER

Filed June 17, 1938 5 Sheets-Sheet 2

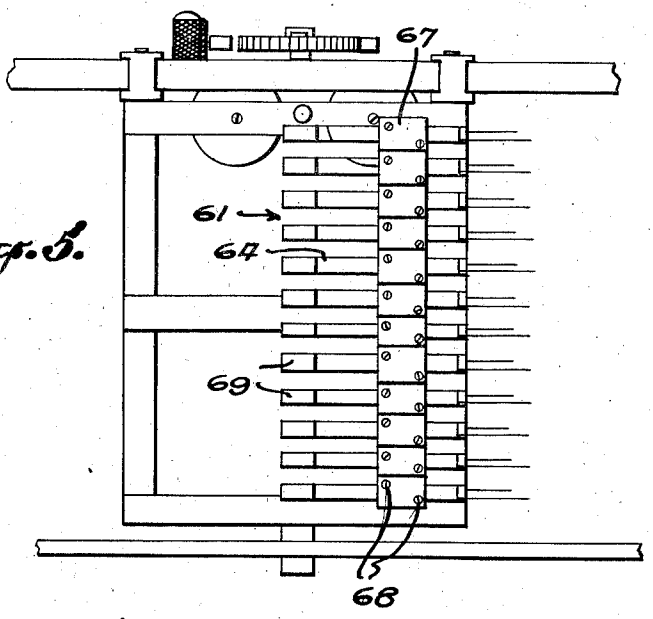


Fig. 3.

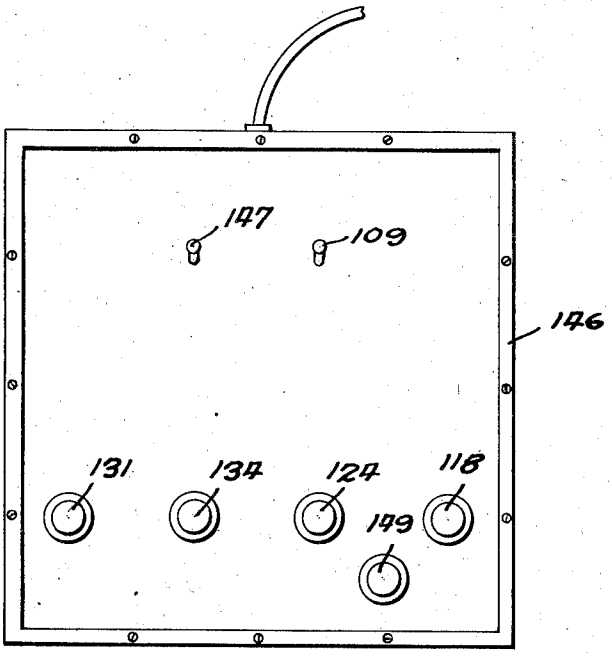


Fig. 2.

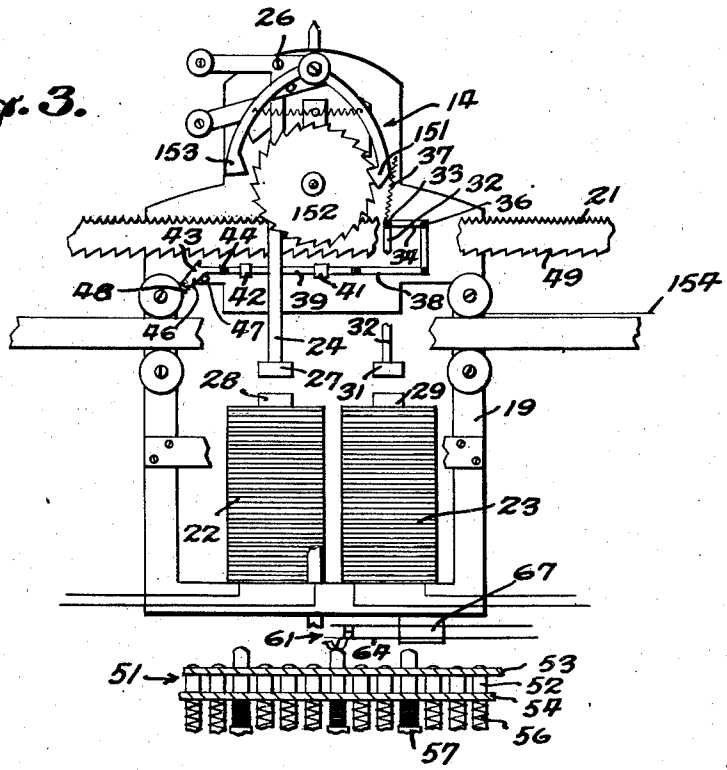
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PHONETIC VERIFIER

Filed June 17, 1938 5 Sheets-Sheet 3

Fig. 3.



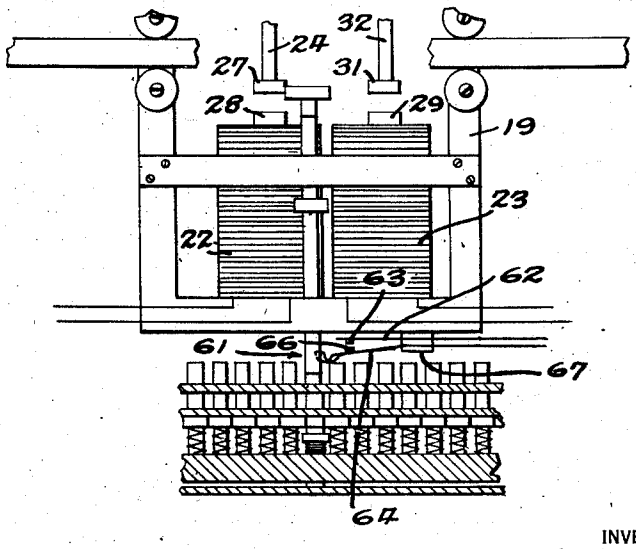


Fig. 4.

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Fig. 6.

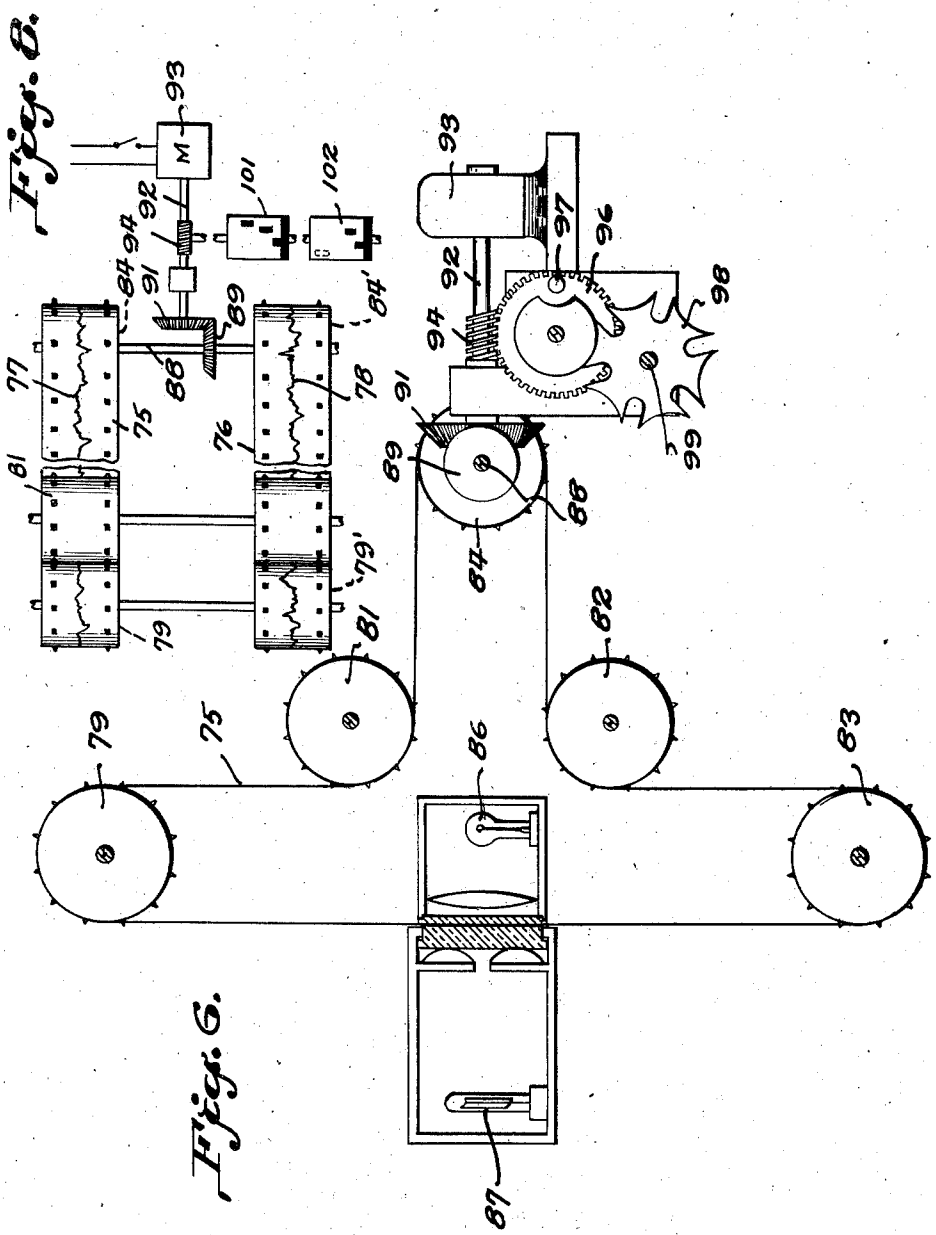


Fig. 6.

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PHONETIC VERIFIER

Filed June 17, 1938 5 Sheets-Sheet 5

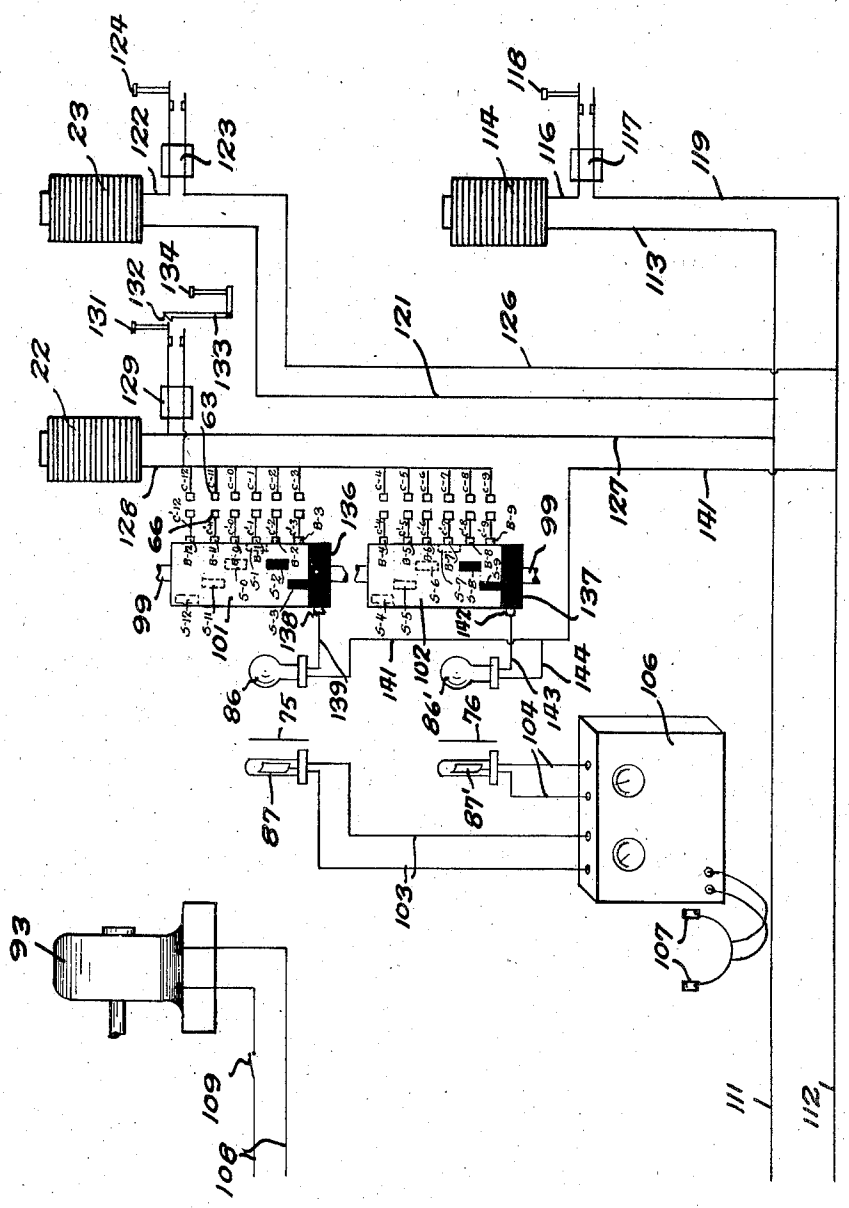


Fig. 7.

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Patented June 2, 1942 2,284,694

UNITED STATES PATENT OFFICE

2,284,694

PHONETIC VERIFIER

Leonard G. Townsend, Washington, D. C.

Application June 17, 1938, Serial No. 214,396

9 Claims. (Cl. 179—100.3)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This invention relates to the art of verifying records such, for example, as the perforate records on the cards used in machines for compiling statistical data and for other business purposes.

There are several methods of verifying punched cards that are in common use today. These methods may be classified, roughly, as consisting of two general types. In one general mode of procedure the verifying machine is used. By this method the cards are first punched from the original record and then placed in a verifying machine. The operator then goes through all the motions of repunching the cards. If the operator strikes a key on the verifier which does not correspond to the key previously struck on a punching machine, the verifier automatically indicates the presence of an error, usually by refusing to skip, and the operator is thereby informed of a card error.

The other general mode of procedure may be designated as the proof tabulation method. This consists of punching the cards from the original records as in the first method, and then tabulating them, that is, listing each card on a paper record. This paper record is then employed in reading back its text against the original record.

Both of these general types of verification have certain disadvantages. When a verifying machine is used in the first method discussed herein, it is necessary for the operator to go through the mechanical motions of repunching the cards from the original documents. Fatigue, caused by the constant necessity of correlating the sense of sight with that of muscular movement, no matter how involuntary this movement may have become through practice, is a highly objectionable factor of this type of verification. This method is also particularly unreliable from the standpoint of accuracy if the manual feed type of machine is used, for, in this event, the operator is compelled to remove her eyes from a particular line on the original record in order to accomplish the act of ejecting the old card and feeding in the new. On the other hand, it has been proven by actual test that greater accuracy is obtained by the proof tabulation method than with the verifying machine as now used. It will be evident on examination that this proof tabulation method also has its disadvantages. For instance, two operators are necessary for the checking procedure. It is also necessary to provide a tabulated list of the punched cards before the checking operation may proceed. The preparation of such a list is necessarily a rather slow and laborious procedure due to the relative speed with which a tabulating machine operates. A further objectionable feature of this type of verification is that by the use of two operators for checking the paper record against the original records, a further opportunity for a multiplication of human error is presented. However, this proof tabulation method has the decided advantage of greater speed and of subjecting the operators to less fatigue than the other method which employs the verifying machine.

The purposes of this invention are to provide for eliminating the fatigue factor involved in the method now used with the verifying machine and to provide for eliminating the necessity of any second operator or checker in the proof tabulation method by substituting for this checker a means capable of faster operation than the tabulator, thereby eliminating the disadvantages and retaining the principal advantages of the two methods previously discussed herein.

These desirable objectives may be attained in accordance with the present invention by sensing a perforate record, such as a punched card, to determine the location of the perforations, and operating sound mechanism preferably selectively in response to the relative positions of the sensed perforations, so that the perforate record may be read back to the operator. The sound equipment may be adapted to enunciate the numerals or other characters corresponding to the position in each column of the sensed perforations, or the sound reproduced may be in the form of a spoken statement giving information represented by the location on the perforate record of the sensed perforation. This general mode of procedure is less tiresome and less monotonous than those previously employed, for it eliminates the muscular movements involved in the old procedure of repunching a record and thereby relieves the operator of the fatigue resulting from such movements; it requires only one operator and yet retains all the advantages of the dependable accuracy of the prior proof tabulation method; and the spoken words issuing from the sound mechanism have at least a tendency to keep that operator more alert.

According to another feature of the invention electro-mechanical means for advancing and for back spacing the carriage may be mounted thereon. This makes it possible to form the mechanical operating connections of relatively simple and yet comparatively rugged and durable construction and eliminates the need for the expensive and rather delicate connections of the prior art where, for example, the operative me-

chanical connections between stationary actuating means, such as magnets, and a traveling carriage frequently comprise a relatively long flexible tube of small diameter and a flexible wire or rod within the tube and operable longitudinally thereof.

This invention also provides improvements in features of construction and relative arrangement and cooperative association of parts.

The features of the invention are illustrated in the accompanying drawings, wherein:

Fig. 1 is a front elevation of a verifying machine;

Fig. 2 is a top plan view of a control box for the machine shown in Fig. 1;

Fig. 3 is a vertical section through the machine shown in Fig. 1, illustrating the sensing means and the carriage associated therewith;

Fig. 4 is a section similar to Fig. 3, but taken in front of Fig. 3 for the purpose of illustrating the error key which is movable with the carriage and the associated die punches which are disposed in front of the sensing means for notching the edge of a card to indicate the column in which an error has occurred;

Fig. 5 is a bottom plan view of the carriage illustrated in Fig. 3;

Fig. 6 is a view in side elevation with parts omitted and broken away illustrating sound mechanism;

Fig. 7 is a diagrammatic view illustrating the wiring connections, receiving set and the sound equipment, parts being omitted and broken away for the purposes of illustration; and

Fig. 8 is a plan view of the sound mechanism shown in Fig. 6.

In the embodiment selected for illustration, a verifying machine indicated generally at 10, (Fig. 1) comprises a housing 11 which may be equipped with a card rack 12 for a record card, and with a slot 13 for the carriage escapement mechanism 14, and a slot 16 for an error punch key 17. A card magazine 18 may also be mounted on the front of the housing. As shown in Fig. 3, this machine may be equipped with a traveling carriage 19 which is controlled by the escapement mechanism 14 which cooperates with a fixed rack 21. Carriage and escapement mechanism of this general type is well known in the art and is illustrated and described in the patents to: Weiland et al. No. 1,684,001, granted September 11, 1928 (Fig. 2); Lasker No. 1,305,557, granted June 3, 1919 (Fig. 2); Lasker No. 1,643,779, granted September 27, 1927, (Figs. 1 and 2); Lasker No. 1,648,546, granted September 18, 1928 (Figs. 3 to 5); Lasker No. 1,798,610, granted March 31, 1931 (Figs. 1 to 4) to all of which reference may be had for a better understanding of features of construction and the principle and mode of operation of this carriage equipment.

In accordance with this invention, electromechanical means in the form of an auto-space magnet 22, a back space magnet 23, and mechanism cooperating with these magnets may be mounted upon the carriage. As shown in Fig. 3, the escapement mechanism is operated by a vertically disposed rod 24 which is connected at its upper end by means of a pivotal connection 26 to the escapement mechanism. This rod carries at its lower end an armature 27 disposed adjacent the stationary core piece 28 of the magnet. It will be understood that when the magnet is energized, the resulting attraction of the armature 27 moves the rod downwardly and thereby actuates the escapement mechanism to advance the carriage with a step by step motion as is well understood in the art.

The back space magnet 23 may be provided with a stationary core piece 29 adapted to attract an armature 31 mounted upon the lower end of a vertically disposed rod 32, the upper end of which may be pivotally connected at 33 to one arm of a bell crank 34 which is mounted to pivot on the carriage at 36. A contractile spring 37 may be connected to this leverage at any suitable point, as at the pivotal connection, the other end of this spring being secured to the carriage frame as shown so that the rod 32 is normally urged upwardly to space the armature, carried thereby, from the core piece 29. The other or depending arm of the bell crank is pivotally connected to a link 38 which is pivotally connected to a horizontally disposed rod 39, the latter being slidably mounted in spaced bearing brackets 41 and 42 mounted on the carriage frame. A pawl 43 may have a pivotal connection 44 with the rod 39. This pawl may be provided on its under side with a cam surface 46 adapted to cooperate with a fixed pin or stop 47. The cam surface is yieldably held in engagement with the stop by means of a contractile spring 48 connected between the pawl and the carriage frame. The under side of the fixed rack 21 may be provided with a series of ratchet teeth 49 which the pawl 43 is adapted to engage.

It will be seen from the foregoing, that when the back space magnet is energized and the armature 31 is attracted by the core piece 29, the resulting downward movement of the rod 32 will swing the bell crank 34 in a counter-clockwise direction as viewed in Fig. 3, and the link 38 and the rod 39 will be moved to the right. This movement will cause the cam surface 46 of the pawl to ride upwardly over the stop 47, thereby swinging the pawl into engagement with one of the ratchet teeth. It will be understood that the pawl and the ratchet teeth are so proportioned and arranged that, during the early or initial part of the movements just described, the pawl engages one of the ratchet teeth, and as the movement is completed, the engagement of the pawl with a fixed ratchet tooth causes the carriage to be pulled to the left, as viewed in Fig. 3, a distance corresponding to the spacing of the ratchet teeth, or in other words, the carriage is "back spaced." It will be evident that this operation may be repeated as desired.

The sensing mechanism is indicated generally by the reference character 51 in Fig. 3. This mechanism comprises a series of aligned extension pins 52 mounted in fixed frame members 53 and 54. Preferably each of these pins carries a relatively light coil spring 56 which seats against the frame member 54 and against a shoulder 57 carried by each pin. The purpose of these springs is to exert a gentle downward pressure on each pin so as to do away with any tendency of the pins to stick in their upper or projected positions. With the exception of the springs 56, these aligned extension pins 52, their cooperative relationship with the throat or passage for a card or other perforate record, and the mechanism for sensing a card or like record may be identical with that disclosed and indicated particularly by the reference characters 17 to 21 inclusive in Fig. 9 of the patent to Powers No. 1,245,504, granted November 6, 1917, to which reference may be had for a better understanding of features of construction, the principle and the mode of operation of the sensing mechanism which are not

specifically disclosed herein. Reference is also made to like sensing mechanism and operating means therefor as disclosed in the patent to Powers No. 1,245,502, granted November 6, 1917 (Figs. 6, 7 and 8), and to the Lasker Patents No. 1,730,513, granted October 8, 1929 (Fig. 1), and No. 1,780,621, granted November 4, 1930 (Fig. 1).

Independently operable means comprising a series of normally open switches 61 may be mounted on the under side of the carriage (Fig. 5) in cooperative relation with the aligned extension pins 52 (Fig. 3). The spacing of these switches corresponds with the spacing of the aligned extension pins for each column of digits or other characters on the card or other record to be sensed. Each switch may comprise a fixed arm 62 carrying a contact 63 and a spring arm 64 carrying a contactor 66 which is engageable with the contact 63 for completing the circuit at this point as illustrated in Fig. 3. The fixed and spring arms of each switch are mounted in an insulator block 67 which is secured to the carriage by suitable attaching elements, such as the screws 68 (Fig. 5). The lower or spring arm 64 of each switch may have its outer end bent or curved downwardly to provide a cam surface 69 (Fig. 5) for engagement with the ends of those aligned extension pins which are projected by the sensing mechanism as illustrated in Fig. 3.

Means for producing sound may comprise sound equipment of any suitable type, but preferably this means comprises a plurality of photographic films 75 and 76 having sound tracks 77 and 78 (Fig. 8) prepared thereon in a manner familiar to the art of talking pictures. As these films and the parts associated therewith are arranged in identically the same manner, only the film 75 and equipment associated therewith are described in detail herein, but the corresponding parts associated with the film 76 are designated in the drawings by the same reference characters bearing prime marks.

The film 75 is an endless film which is trained over idler guide sprockets 79, 81, 82 and 83 and over a driving sprocket 84. The portion of the film extending between the idler sprockets 79 and 83 passes between a light bulb 86 and a photo-electric cell 87. The cooperative arrangement of a light bulb and a photo-electric cell for reproducing sound from a sound track on a film passing therebetween is well understood in the art, and therefore, further description of this arrangement and the adjunctive features for the practical application thereof is deemed unnecessary herein.

Preferably the driving sprockets 84 and 84' for the films 75 and 76 respectively, are mounted upon a common shaft, such as the shaft 88 upon which a bevel gear 89 is fixedly secured. A bevel gear 91, which meshes with gear 89, may be fixedly mounted on the armature shaft 92 of a driving motor 93. This armature shaft may also be provided with a worm 94 which meshes with a worm wheel 96. A Geneva stop motion may be operatively associated with this worm wheel and as shown this motion comprises a pin 97 mounted on the worm wheel and cooperatively associated with a Geneva gear 98 which is fast on a shaft 99 upon which contact drums 101 and 102 are also fixedly secured in suitably spaced relation.

As shown in Fig. 7, the photo-electric cells 87 and 87' are electrically connected by means of circuits 103 and 104 respectively, with amplification unit 106 of any suitable type. This amplification unit may be provided with a loud speaker or with ear phones 107 as shown. It will also be seen from Fig. 7 that electrical energy for operating the motor may be supplied through a circuit 108 which is controlled by a suitable switch 109.

Electrical energy for the electro-mechanical equipment, the timing and selective control circuits, may be supplied from the lines 111 and 112. From the line 111 a conductor 113 leads to the eject magnet 114. A conductor 116 leads from this magnet to one terminal of a normally open switch 117 which is adapted to be closed by pressing down a key 118. A conductor 119 leads from the other terminal of this switch to the line 112.

The circuit for the back space magnet 23 may comprise a conductor 121 leading from line 111 to one terminal of the magnet, a conductor 122 extending between the other terminal of the magnet and one terminal of a normally open switch 123 which is adapted to be closed by depressing an operating key 124. From the other terminal of this switch a conductor 126 extends to the line 112.

The circuit for the auto-space magnet 22 may comprise a conductor 127 extending between the line 111 and one terminal of the magnet and a conductor 128 extending between the other terminal of the magnet and through one or the other of parallel circuits, hereinafter described, and then to the line 112. A normally open switch 129 has one terminal connected to the conductor 127 and the other terminal thereof connected to the conductor 128. This switch is adapted to be closed by depressing a key 131. This switch may be releasably held in closed position by a latch 132 formed on one arm of a bell crank 133. The arrangement is such that when the upper arm of the switch 129 is depressed, it is engaged and held in this position, in which the switch is closed, by the latch. A depressable key 134 may be provided for engaging the other arm of the bell crank to release the latch when desired. It will be evident that the bell crank may be balanced to maintain the latch normally in a cooperative relation with the upper arm of the switch or suitable resilient means, such as one or more springs (not shown) may be provided for this purpose.

The normally open switches 61 (Figs. 3, 4 and 5) constitute the carriage contact assembly. The contacts 63 and 66 of each of these switches are represented diagrammatically in Fig. 7 as disposed in independent circuits extending between the conductor 128 and the contact drums 101 and 102. The contacts 63 of these switches may be individually connected to the conductor 128 by conductors C—12, C—11, C—0, C—1, C—2, C—3, C—4, C—5, C—6, C—7, C—8 and C—9, respectively. The contacts 66 of these switches may be individually connected to brushes B—12, B—11, B—0, B—1, B—2, B—3, B—4, B—5, B—6, B—7, B—8 and B—9, by conductors C'—12, C'—11, C'—0, C'—1, C'—2, C'—3, C'—4, C'—5, C'—6, C'—7, C'—8 and C'—9, respectively. Contact drum 101 may be provided with helically spaced contact segments S—12, S—11, S—0, S—1, S—2, and S—3, which are individually engageable in succession with the brushes of the series B—12 to B—3 inclusive. In a like manner contact drum 102 may be provided with helically spaced contact segments S—4, S—5, S—6, S—7, S—8 and S—9 which are individually engageable in succession with the brushes of the series B—4 to B—9 inclusive.

All of the segments S—12 to S—3 inclusive of drum 101 may be electrically connected to a ring contact 136 carried by the drum. Similarly all of the segments S—4 to S—9, inclusive, may be electrically connected to a ring contact 137 carried by the drum 102. The drums 101 and 102 are so mounted upon the shaft 99 and the segments S—12 to S—9, inclusive, are so spaced about these drums that only one of these segments may engage one of the brushes B—12 to B—9, inclusive, at any position of the drums.

The circuit for the light bulb 86 may comprise a brush 138 engaging the ring contact 136, a conductor 139 extending between this brush and one terminal of the light bulb and a conductor 141 extending between the other terminal of the light bulb and the line 112. Similarly the circuit for the light bulb 86' may comprise a brush 142 engaging the ring contact 137 of drum 102, a conductor 143 extending between this brush and one terminal of the light bulb and a conductor 144 which extends between the other terminal of the light bulb and conductor 141 which leads to line 112.

It will be observed that the circuits just described for the light bulbs 86 and 86' are parallel circuits extending between the conductor 128, which is connected to one terminal of the auto-space magnet, and conductor 141 which extends to line 112. When the switch 129 is open and one or the other of these parallel circuits is completed as just described, it will be seen that the auto-space magnet will be energized, armature 27 will be attracted to the core piece 28 and rod 24 will be moved downwardly. This movement causes pawl 151 to be disengaged from the escapement wheel 152 and pawl 153 will engage a tooth of this escapement wheel without allowing appreciable rotary movement of the latter. The parts remain in this condition while the pin 97 travels from one of the recesses in the Geneva gear 98 into the succeeding recess of this Geneva gear. In other words the worm wheel 96 makes nearly a complete revolution before the Geneva gear receives its next partial rotation and during this period the carriage (Fig. 3) remains practically stationary so that one of the parallel circuits through the lamp bulbs and the magnet 22 remains completed. When the Geneva gear receives its next partial rotation this same rotary movement is imparted to the contact drums 101 and 102 and as previously explained, this breaks the circuit through the auto-space magnet at the contact drums. When this occurs the auto-space magnet is deenergized, rod 24 is moved upwardly by a spring and as the pawls 151 and 153 swing free, the carriage is moved to the right as viewed in Fig. 2 by a pull cord 154 a distance of one column where it is stopped by engagement of pawl 151 with the escapement wheel. This step advance movement of the carriage moves the particular switch 61, which had been closed, from above the particular projected aligned extension pin 52 which had held this switch closed so this switch opens automatically. Therefore, no further advance of the carriage will be produced by the auto-space magnet until the circuit through this magnet is again completed by the closing of one of the switches 61 and the completing of one of the parallel circuits.

It is also contemplated that verifying apparatus of the type disclosed herein may be provided with a control box 146 (Fig. 2). Thus the switch 109 (Fig. 7) for controlling the motor circuit may be in this control box as shown in Fig. 2. A switch 147 may also be mounted in the control box for controlling the sound mechanism in a manner well understood in the art. This control box may be equipped with a repeat key 131, an auto-space key 134 (Fig. 7), a back space key 124 (Fig. 7), a skip key 149 and an eject key 118 (Fig. 7). The names of these keys sufficiently indicate their functions which are well known in the art and therefore, further description is deemed unnecessary.

In using this apparatus, the motor switch 109 in Figs. 2 and 7 is closed so that the motor 93 may operate continuously. The films 75 and 76 are, of course, previously adjusted so that the portions of the sound track on the film 75, which are adapted to cooperate in the reproduction of distinguishable sounds informative of the positions in the card column of sensed perforations representing digits of series 12 to 3, inclusive, will register successively with the lamp 86 and photo-electric cell 87 simultaneously with engagement of corresponding brushes B—12 to B—3, inclusive, and the segments S—12 to S—3, inclusive. The film 76 is likewise adjusted so that the portions of the sound track on this film, which are adapted to cooperate in the reproduction of distinguishable sounds informative of the positions in the card column of sensed perforations representing digits of the series 4 to 9, inclusive, will register successively with the light bulb 86' and the photo-electric cell 87' when the brushes B—4 to B—9, inclusive, register with the segments S—4 to S—9, inclusive. Cards, or like perforate records to be sensed, may be fed to the sensing mechanism, indicated generally in Figs. 1 and 3, in a manner familiar to the art, and fully disclosed in the patents to Lasker and to Powers, previously identified herein.

The sensing mechanism functions in the usual manner, and where perforations occur in a column or columns of a card the aligned extension pins 52 (Fig. 3) are projected upwardly into the path of the carriage contact assembly comprising the normally open switches 61 of Figs. 3 to 5. The carriage is adapted to be advanced across the sensing means with an intermittent, step-by-step advance as previously described herein. When it is desired to cause the carriage to remain over a particular column for the purpose of causing a repetition of the enunciation of the sound mechanism for a particular column position to occur, the switch 129 is closed, thereby shorting space magnet 22, thus precluding further advance of the carriage while the sound mechanism continues to function upon each complete circuit of the sound film. The switch 129 may be closed by depressing key 131, and when this key is so depressed it is held in this position by the latch 132 until the latter is released by depressing the automatic space key 134, which restores the automatic spacing function of the carriage.

If for any reason it should be desired to back space the carriage one or more columns, this may be accomplished by depressing the back space key to energize the back space magnet 23 and, as previously explained herein, to cause the pawl 43 to engage one of the ratchet teeth 49 thereby pulling the carriage to the left, as viewed in Fig. 3.

As the carriage advances to a position in which the normally open switches 61 are in cooperative relation with the aligned extension pins 52 for that particular column, it will be evident that one or more of the pins in this column which are

projected to their upper positions will be effective to engage the curved end portions 69 of the lower arm 64 of these switches, thereby forcing these arms upwardly to close the contacts 63 and 66 of the particular switches so engaged. This operation serves as a selecting means for determining which portion or portions of the sound tracks are to be rendered effective for enunciating distinguishable sounds, such as the digits corresponding to the column position of the perforations in the card to be sensed. As the films 75 and 76 which carry the sound tracks are operating continuously, timing means in the form of the contact drums 101 and 102 serve to determine the period in the travel of the sound tracks at which the circuit is finally completed to reproduce the sound. Thus, for example, the digit positions in a column on a card being sensed may read 12, 11, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9; and if the perforation sensed in that particular column corresponds to the number 11 digit position, the switch 61 corresponding to this position will be closed and the circuit will be completed from conductor 128 (Fig. 7) through the conductor C—11, through the switch, conductor C'—11 to brush B—11; and when the drum 101 has rotated to a position to bring the contact segment S—11 into engagement with the brush B—11, the circuit will then be completed from this contact segment to the ring contact 136, brush 138, conductor 139, to the lamp 86, and then through conductor 141 to the conductor 112. It will be understood that when the circuit is completed through the lamp 86, the portion of the sound track passing this source of light will influence the photo-electric cell 87 to cause the proper sound or numeral "eleven" to be enunciated in the loud speaker (not shown) or in the ear phones 107 of the amplification unit. Likewise, if the perforation sensed in a card corresponds to the number 7 digit position, for example, the engagement of the corresponding aligned extension pin 52 with the curved outer end 69 of the corresponding switch 61 will complete a circuit from conductor 128 through conductor C—7, through the switch, conductor C'—7, brush B—7; and when the drum 102 has rotated to a position to bring contact segment S—7 into engagement with brush B—7 a circuit is then completed from this contact segment to the ring contact 137, thence through brush 142, conductor 143, light bulb 86', conductor 144, conductor 141, to conductor 112. In this instance the numeral "seven" may be enunciated by the sound equipment, and so on.

It will also be noted from Figs. 6 and 7 that the contact drums 101 and 102 which are mounted upon shaft 99 of the Geneva gear 98 are given an intermittent rotary motion due to this Geneva stop movement. This intermittent motion is so arranged as to bring each contact segment of each drum directly into cooperative relation with the corresponding brush provided for engagement with such segment. It will be clear, therefore, that in sensing a particular perforation on a card, portions of both sound tracks representing several different digit positions may pass between the lamp bulbs 86, 86' and the photo-electric cells 87 and 87' without producing any sound because the circuit through these lamp bulbs is not completed until the proper segment on one of the drums has been brought into electrical contact with the brush which completes the circuit through one or the other of the lamp bulbs. It is therefore advantageous to provide a plurality of sound tracks as this reduces the time required for the film carrying the portion of the sound track corresponding to the sensed digit position to arrive between the lamp bulb and the photo-electric cell. While only two of these films have been shown, it will be apparent that the number of films may be increased for this same purpose if desired. If the operator for any reason desires to discontinue the sound, it is only necessary to open the switch 147 in the control box (Fig. 2). It will also be understood that the operator may manipulate the keys 131, 134, 124, 149 and 118 as may be required in the usual operation of an apparatus of this general type.

The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment to me of any royalty thereon.

I claim:

1. In a verifier of the class described, the combination of one or more travelling sound tracks having different portions thereof adapted to produce distinguishable sounds substantially corresponding in number to the number of digit positions in a column of a card to be verified, means cooperable with said one or more sound tracks for producing sound, electrical means comprising different circuits for controlling the production of said distinguishable sounds, means for sensing a perforated card, a carriage adapted to travel across said sensing means, timing means for completing each of said circuits in timed relation with the travel of said one or more sound tracks, and switches movable with said carriage and operable selectively by said sensing means for determining which of said circuits is to be completed.

2. In a verifier of the class described the combination of one or more travelling sound tracks having different portions thereof adapted to produce distinguishable sounds substantially corresponding in number to the number of digit positions in a column of a card to be verified, means cooperable with said one or more sound tracks for producing sound, electrical means comprising different circuits for controlling the production of said distinguishable sounds, means for sensing a perforate card, a carriage adapted to travel transversely of said sensing means, electro-mechanical means mounted on said carriage for spacing the latter in either direction of travel thereof, timing means for completing each of said circuits in timed relation with the travel of said one or more sound tracks, and switches mounted upon said carriage and operable selectively by said sensing means for determining which of said circuits is to be completed.

3. In a card verifier of the class described, the combination of one or more sound tracks each having succeeding portions thereof adapted to produce sounds each distinguishable from the other so as to provide for producing a total number of such sounds substantially corresponding to the number of digit positions in a column of a card to be verified, means cooperable with said one or more sound tracks for producing sound, independently operable means disposed on one side of a card to be verified, each of said independently operable means being operable for controlling the production of sound over a different one of said succeeding portions of said one or more sound tracks, and sensing means disposed on the other side of a card to be verified and operable at perforations in a card being verified for selectively actuating said independently operable means.

4. In a card verifier of the class described, the combination of one or more sound tracks each having succeeding portions thereof adapted to produce sounds each distinguishable from the other so as to provide for producing a total number of such sounds substantially corresponding to the number of digit positions in a column of a card to be verified, means cooperable with said one or more sound tracks for producing sound, independently operable switches disposed on one side of a card to be verified, each of said switches being operable for controlling the production of sound over a different one of said succeeding portions of said one or more sound tracks, and sensing means disposed on the other side of a card to be verified and operable at perforations in a card being verified for actuating said switches.

5. In a card verifier of the class described, the combination of one or more travelling sound tracks each having succeeding portions thereof adapted to produce sounds each distinguishable from the other so as to provide for producing a total number of such sounds substantially corresponding to the number of digit positions in a column of a card to be verified, means cooperable with said one or more sound tracks for producing sound, electrical means comprising circuits for controlling the production of each of said distinguishable sounds, sensing means comprising sensing elements operable at perforations of a card being verified, timing means for coordinating the completion of said circuits with the travel of said sound tracks, and means responsive concurrently to said timing means and to the projection of sensing elements at perforations in a card being verified for completing a circuit to cause the production of a sound distinguishing the position of the perforation in the card at which the sensing element projects.

6. In a card verifier of the class described, the combination of one or more travelling sound tracks each having succeeding portions thereof adapted to produce sounds each distinguishable from the other so as to provide for producing a total number of such sounds substantially corresponding to the number of digit positions in a column of a card to be verified, means cooperable with said one or more sound tracks for producing sound, timing means including intermittently operable means for establishing normally open circuits in properly timed relation with the travel of said sound tracks, sensing means comprising sensing elements operable at perforations of a card being verified, and means responsive to the projection of sensing elements at perforations in a card being verified for completing a circuit established by the timing means to cause the production of a sound identifying the position of the perforation at which the sensing element projects.

7. In a card verifier of the class described, the combination of one or more travelling sound tracks each having succeeding portions thereof adapted to produce sounds each distinguishable from the other so as to provide for producing a total number of such sounds substantially corresponding to the number of digit positions in the column of a card to be verified, means cooperable with said one or more sound tracks for producing sound, timing means including intermittently operable means for establishing normally open circuits in properly timed relation with the travel of said sound tracks, sensing means disposed on one side of a card to be verified and comprising sensing elements operable at perforations thereof, and means disposed entirely on the other side of a card to be verified and responsive to the projection of sensing elements at perforations in said card for completing a circuit established by the timing means to cause the production of a sound identifying the position of the perforation at which the sensing element projects.

8. In a card verifier of the class described, the combination of sensing means comprising sensing elements disposed on one side of a card to be verified and projectable from the other side of said card at perforations thereof, a carriage adapted to traverse said sensing means along said other side of said card, means for producing distinguishable sounds substantially corresponding in number to the number of digit positions in a column of said card, means providing electrical circuits for controlling the production of said distinguishable sounds, and switches movable with the carriage along said other side of said card for controlling said circuits in response to engagement with sensing elements projecting at perforations of said card.

9. In a card verifier of the class described, the combination of one or more travelling sound tracks each having succeeding portions thereof adapted to produce sounds each distinguishable from the other so as to provide for producing a total number of such sounds substantially corresponding to the number of digit positions in a column of a card to be verified, means cooperable with said one or more sound tracks for producing sound, independently operable means disposed on one side of a card to be verified for controlling the production of sound over each of said succeeding portions of said one or more sound tracks, timing means for rendering said independently operable means effective in properly timed relation with the travel of said one or more sound tracks, and sensing means disposed on the other side of a card to be verified and operable at perforations therein for selectively actuating said independently operable means.

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