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3,096,017

VOTING MACHINE

Filed Dec. 9, 1960

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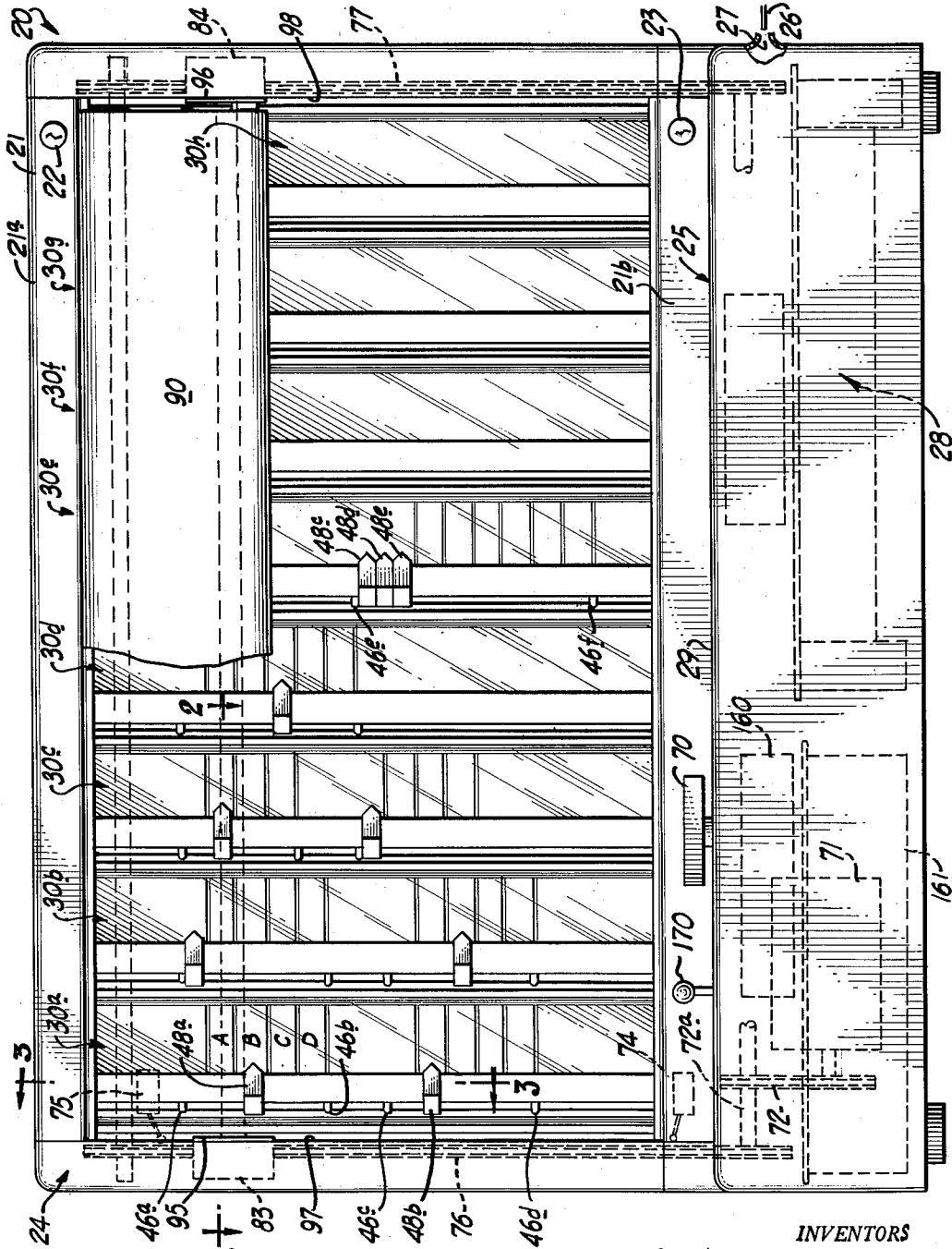


Fig. 1

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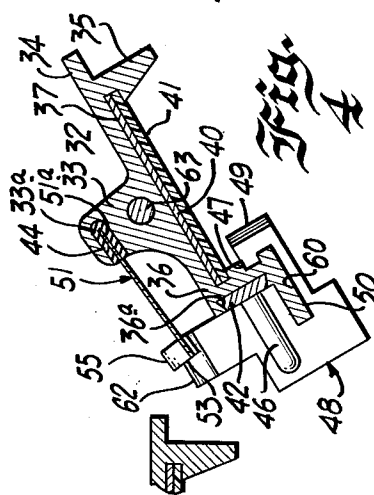
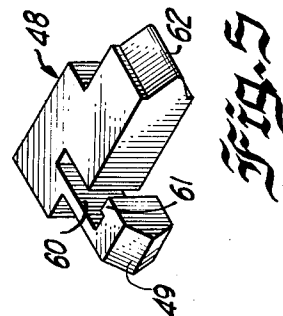
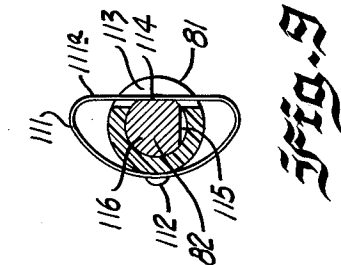
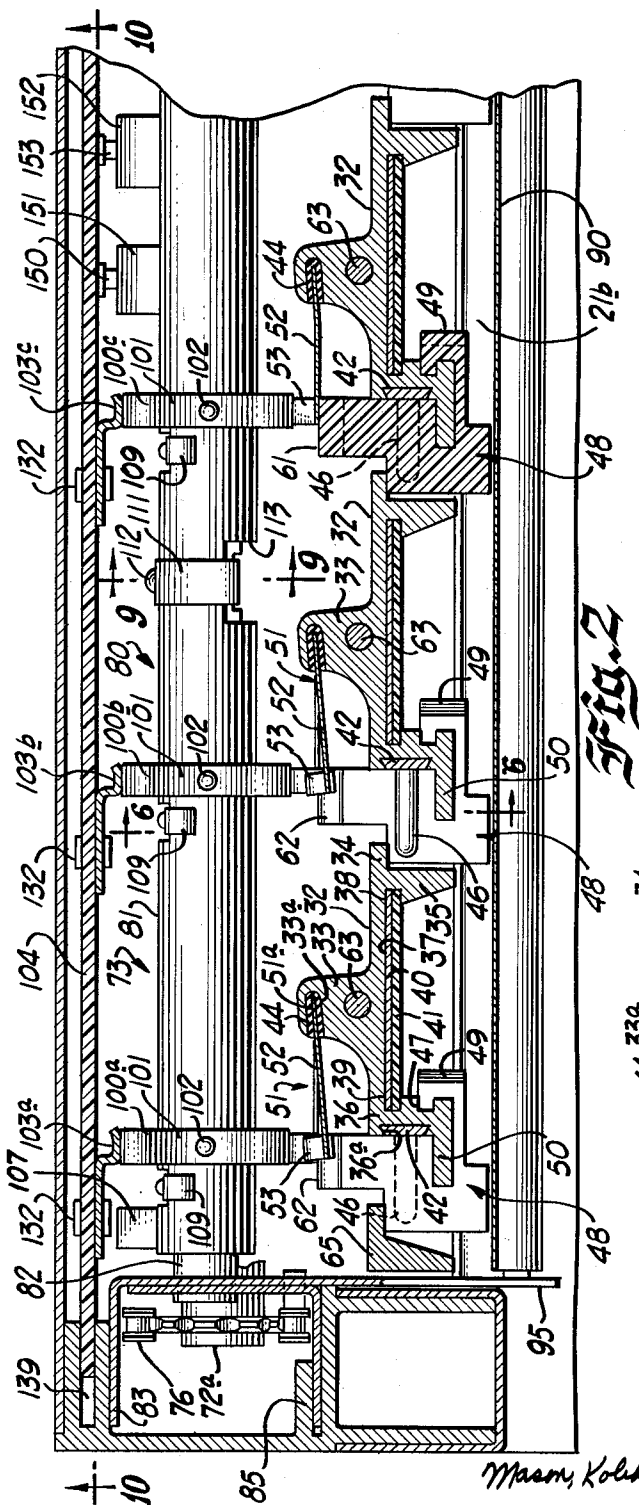
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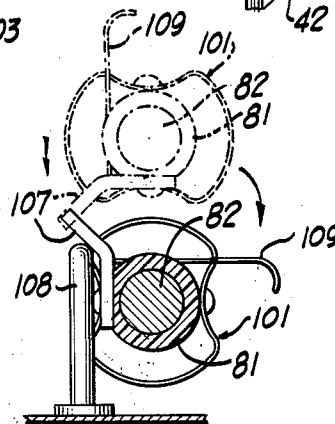
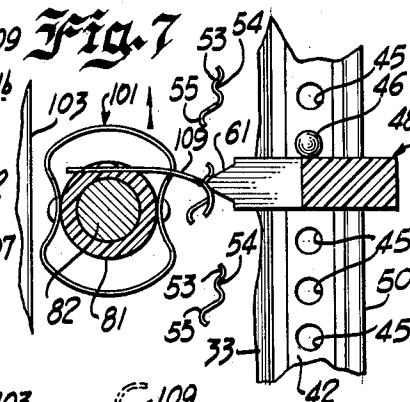
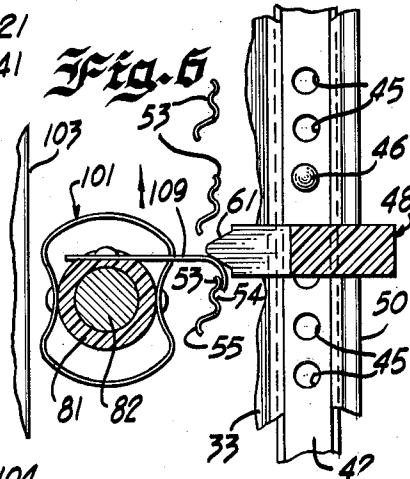
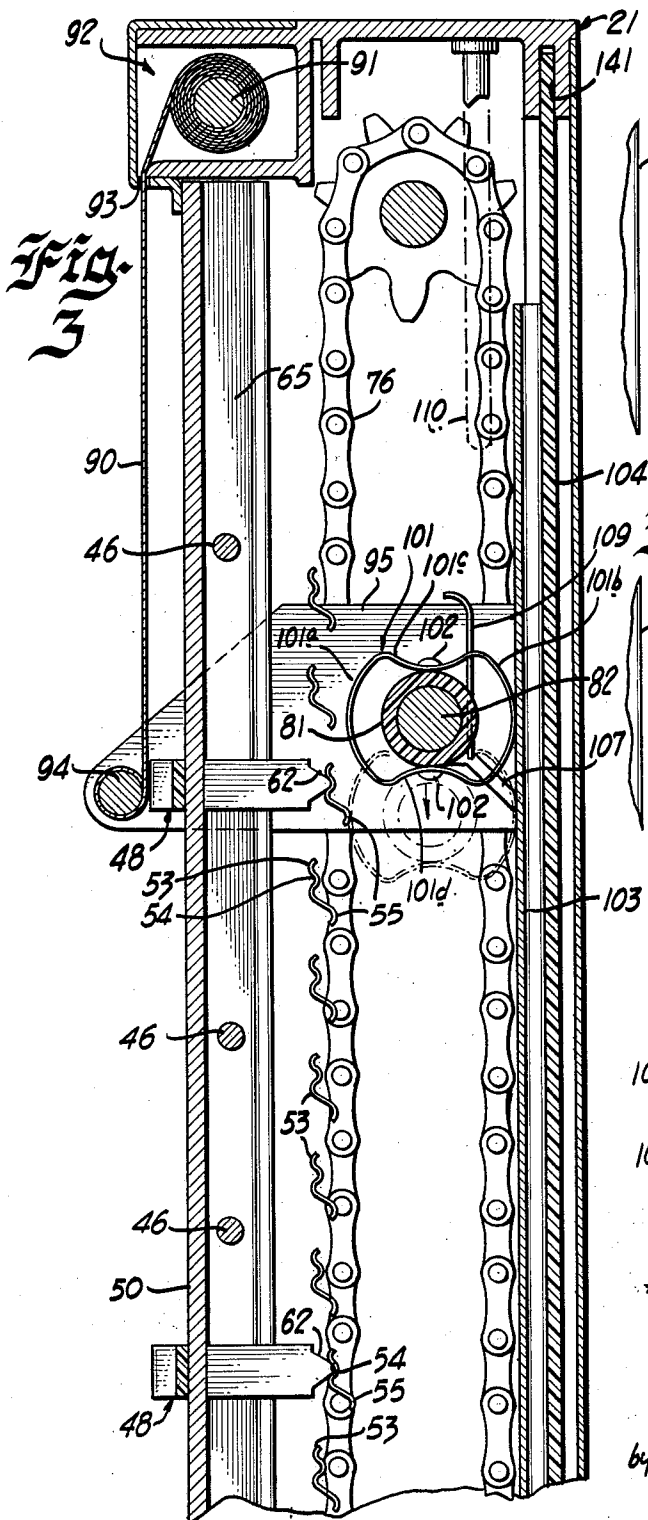


Fig. 8

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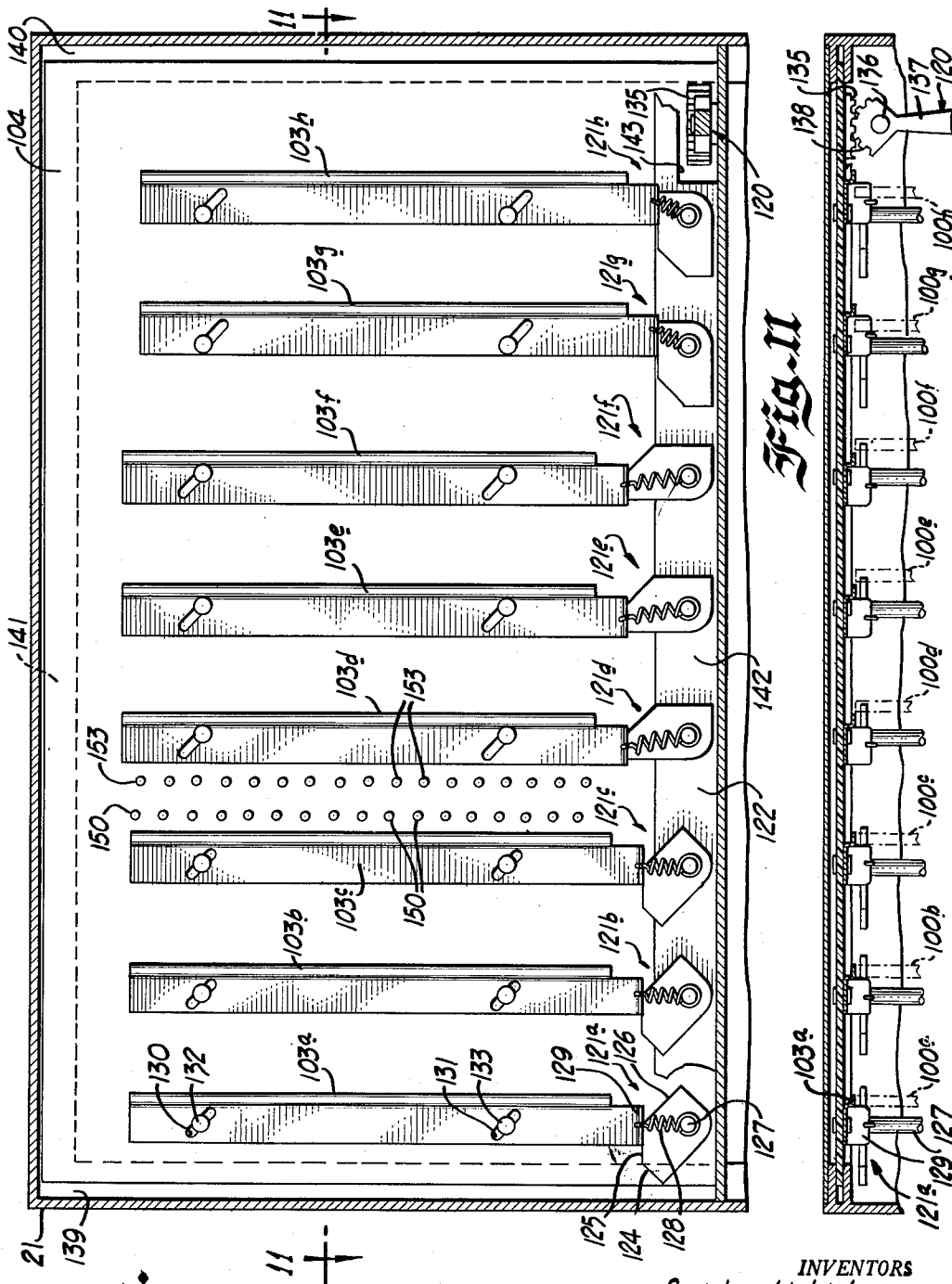
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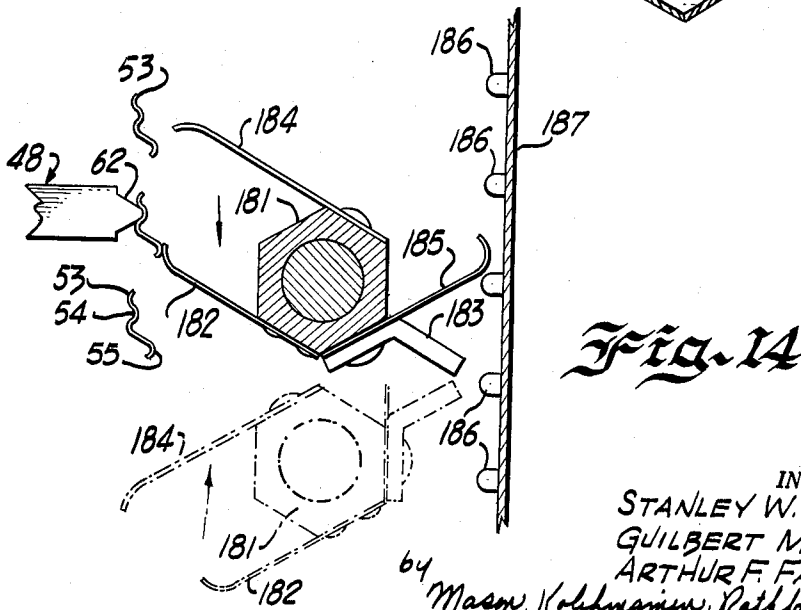
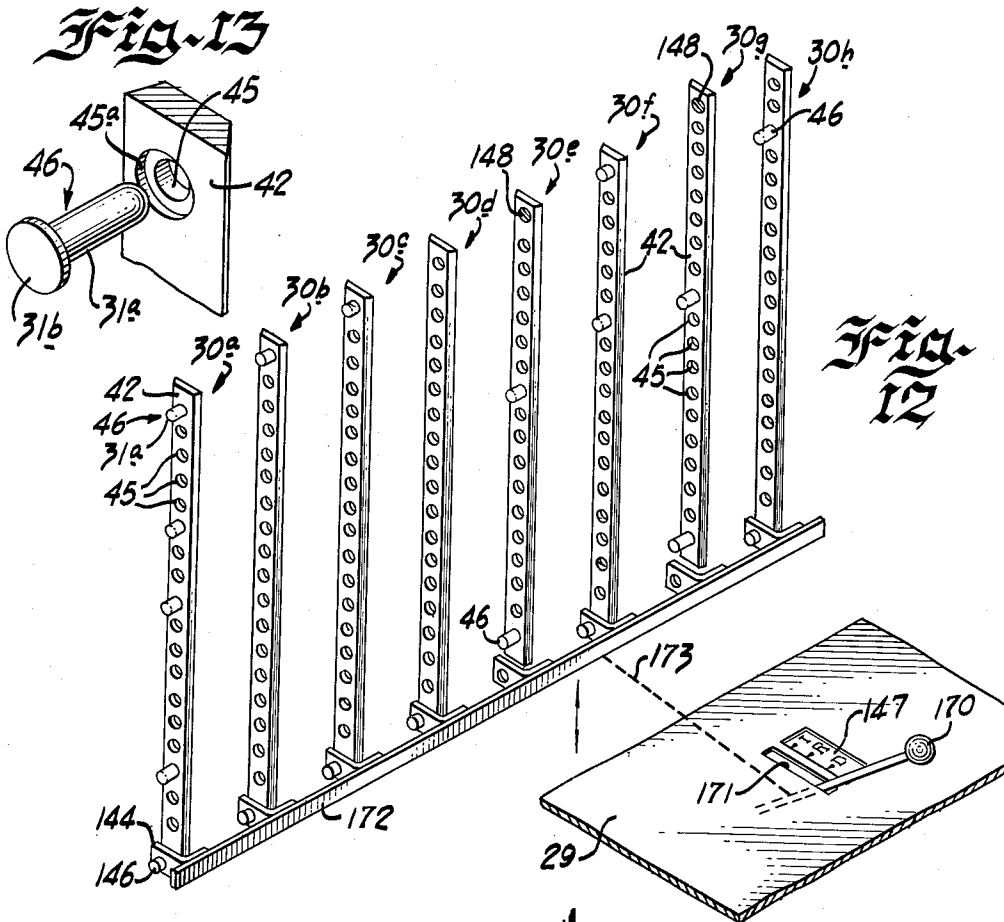
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VOTING MACHINE

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30 Claims. (Cl. 235—54)

This invention relates generally to voting machines and is particularly concerned with a light, compact, easily transportable, relatively inexpensive voting machine.

Voting machines presently in use employ a voting panel divided into columns and rows providing a large number of selecting positions. At each selecting position a manually operable selector is provided for operation by the voter in making his choice. These machines require elaborate interlocks to satisfy all of the conditions which may be necessary in the various jurisdictions using voting machines. Thus, it is necessary to interlock the selectors so that in a contest where a single choice must be made between two or more candidates, it will be impossible for the voter to operate more than one selector. Moreover, in some instances the voter is required to cast votes for two or more candidates of a relatively large group and in such cases it is necessary that interlocks be provided to prevent overvoting, that is, the arrangement must be such that after the required number of choices have been made, it is impossible to operate any additional selectors. In addition, in some elections as, for example, in primary elections or in decisions on questions where only a particular class of voters such as property holders may participate, the machine must be set up prior to the casting of each vote so that the voter may make choices only on those issues in which he is eligible. Interlocks must be provided to prevent the casting of votes on other issues. Thus, it is apparent that the interlock mechanism is extremely complex and adds considerably to the size and weight of the machine. Moreover, since each election presents a completely different set of interlock problems, it is obvious that the task of setting up or programming the machine is exceedingly laborious and time consuming and can be performed only by highly skilled persons. As a result of the complexity of construction, the voting machines now in use are very expensive, can be maintained and/or repaired only by skilled persons, are large, heavy and bulky so that they cannot be transported easily to and from the voting station before and after elections and, in addition, they occupy a tremendous amount of storage space between elections. In addition, the weight of these machines makes them suitable for use only in buildings which have floor areas capable of supporting them, a problem which in some instances leads to the location of a voting station at a point not centrally or conveniently located in the area served. Despite all of these glaring disadvantages, the basic design of voting machines has not changed in the last half century. Weighed against these disadvantages are the rapidity with which the vote may be cast and registered and the rugged, relatively trouble-free construction.

The primary object of the present invention is to provide a voting machine which retains to a large extent the advantages of the machines now in use but at the same time avoids all of the aforementioned disadvantages.

A further object of the invention is to provide a voting machine of small size and weight which is inexpensive to manufacture when compared with machines presently in use.

Another object of the invention is to provide a voting machine which prevents overvoting or casting of votes

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on issues for which the voter is not qualified but which, at the same time, avoids the use of complex interlocks between the selectors of the machine.

The invention has for another object the provision of a voting machine which is very easy to set up or program for an election.

The invention has for a further object the provision of a voting machine having a new and improved mechanism for party voting to permit the voter to vote a so-called "straight ticket" wherein he votes for all of the candidates of a particular political party.

The invention has for an additional object a voting machine of the type wherein a cover is provided for the front panel of the machine to preserve the secrecy of the ballot by preventing the next succeeding voter from seeing the previous voter's selections, the selectors being restored to their neutral positions prior to the uncovering of the panel.

Another object of the invention is to provide a new and improved scanning mechanism for sensing the voter's selections and for returning all of the selectors to neutral position.

Further objects and advantages of the invention result from certain details of construction and features among which may be particularly mentioned the use of a single, continuous member containing a plurality of detent spring fingers for holding the different selectors in voting positions; the use of a column pivoted about a vertical axis to facilitate programming by insertion of stops and voting keys in predetermined order into each column; the unique construction of each column to permit it to hold a number of different component elements such as the detent springs, the office stops, the voting keys and a candidate display card or strip; the construction of the scanning rail to permit scanning of the selectors as the rail sweeps in one direction along the voting panel with the rail being turned through a predetermined angle at the completion of the sweep to move it to a position for restoring the selectors as the rail sweeps in the reverse direction; and the mechanism for programming the machine by individually moving a contact strip associated with each column to any one of several different positions together with structure for shifting all of the contact strips in unison to different positions to render different ones of the columns active.

The foregoing and other objects are realized, in accordance with the present invention, by providing a voting machine having a front panel formed by a plurality of side by side columns each pivoted for turning about a vertical axis. Each column supports a strip extending lengthwise and containing a list of different issues or candidate groups to be decided by the voter. Each group is divided into several selecting positions listing the different alternatives or candidates for that particular office. The candidate groups are separated by stop pins which are mounted in fixed positions upon the column but which can be placed in any desired position during programming. Mounted for sliding movement upon the column are several voting keys or selectors there being provided in each office group a number of keys exactly equal to the number of votes being cast in that group. Thus, in the usual office group where a single selection must be made from a group of candidates, only one voting key is provided and this key may be moved from a neutral position adjacent one of the stop pins to a selecting position adjacent the name of the candidate selected by the voter. This key cannot be moved past the office stop pins and, hence, only one vote may be cast within the office group. If more than one vote is to be cast within an office group, several voting keys equal in number to the total number of votes to be cast are inserted between the stop pins defining that group.

If cumulative voting is permitted the name of each candidate will appear more than once on the candidate strip and, hence, the voter may divide his votes in any manner which he desires by giving all or several of his votes to a single candidate or by splitting them among several candidates. Each column also supports an elongated member carrying a plurality of detent spring fingers for holding the voting keys in any position selected.

The machine is programmed by unlocking column retaining panels to permit the columns to be pivoted about their axes and by then inserting the office stop pins, the voting keys and the candidate strips. The columns are then pivoted back to form a voting panel and are locked in position by the retaining panels.

To begin the voting operation the voter inserts a ballot card which is held in position while the voter moves the voting keys to make his selections. A party vote mechanism is provided for moving the keys in unison through a predetermined number of selecting positions to enable the voter to vote for all of the candidates of a political party. The party vote mechanism then releases all of the keys for individual movement and is then locked so that it may be used only once during a voting operation. After the keys are released, the voter may, of course, change his vote on particular offices by moving the keys within such offices to positions adjacent the names of candidates other than those of his chosen party. Moreover, each key may be moved individually, if desired, without using the party vote mechanism.

After the selections have been made, the voter starts the registering operation by depressing a vote switch which starts the movement of a scanning device along the rear of the voting panel and, at the same time, begins the closing of a cover or curtain for the front panel of the machine. As the scanning device moves along the panel, the ballot card is advanced past a series of punches each of which is electrically connected to one of the columns. At each position where one of the voting keys in one of the columns has been moved to a selecting position in the path of movement of the scanning device an electrical circuit is completed to the punch associated with that column and, hence, a hole is punched in the ballot card at a position corresponding to that of the voting key selected. Provision is also made for punching the card with holes identifying the voting station at which the ballot was cast.

In one form of the invention the scanning device takes the form of a horizontal rail which may be rocked about its longitudinal axis. The rail carries switches for controlling the step by step advancement of the ballot card and for sensing the voter's selections. As the scanning rail is continuously driven in one direction along the voting panel from row to row, the card control switch successively engages fixed stops which periodically close the switch in order to supply electrical signals for advancing the card. The sensing switches are closed whenever they encounter a voting key in a selecting position in which case they complete an electrical circuit to the associated punch. When the scanning rail reaches the end of its sensing sweep, a detent thereon is engaged by a fixed stop to rock the rail to a position wherein the control switches can no longer engage the voting keys or the card control stops. When the rail is rocked, a set of key restoring fingers moves to a position for engaging the voting keys during the return sweep of the rail. As the rail returns, the fingers pick up the keys and return them to their neutral positions against their associated stops.

In another form of the invention, the electrical circuit between each punch and its associated column includes an elongated contact strip spaced from but extending parallel to the column. These contact strips are adjustably mounted upon an insulator panel and may be moved into or out of alignment with the detents. The entire panel is shiftable as a unit under the control of a manually

operated selector mechanism which is thrown to a position corresponding to the voter's classification. Thus, in a primary election the names of all of the candidates of one party for the different offices to be filled are placed in selected few of the columns. The contact strips associated with these few columns are aligned with the detents of these columns when the selector mechanism is thrown to a position corresponding to the voter's party. All other columns are inactive because their contact strips and detents are misaligned and, hence these columns are incapable of completing electrical circuits to their associated punches. Thus, the voter may cast votes only for candidates of his own party and any attempt to vote for candidates of the other party or parties has no effect upon the punches.

The invention, both as to its organization and manner of operation, together with further objects and advantages thereof will best be understood by reference to the following detailed description taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a front elevational view illustrating a voting machine characterized by the features of the present invention;

FIG. 2 is an enlarged, fragmentary, sectional view taken along a line substantially corresponding to the line 2—2 of FIG. 1;

FIG. 3 is an enlarged, fragmentary, sectional view taken along a line substantially corresponding to the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary, sectional view showing one of the columns making up the front panel of the voting machine in its outwardly pivoted position as used in setting up the machine prior to an election;

FIG. 5 is a perspective view illustrating a voting key or selector which may be used in the voting machine shown in FIG. 1;

FIG. 6 is a fragmentary, section view taken along a line corresponding substantially to the line 6—6 in FIG. 2 illustrating the operation of the key restoring mechanism during the key restoring or return sweep of the scanning rail;

FIG. 7 is a view similar to FIG. 6 but shows the passage of the key restoring fingers over the voting keys after the keys have been restored to their neutral positions;

FIG. 8 is a fragmentary view similar to FIGS. 6 and 7 but illustrating the turning or rocking of the outer shell of the scanning rail at the bottom of the vote detecting sweep;

FIG. 9 is a sectional view taken along a line substantially corresponding to line 9—9 in FIG. 2 and illustrating the detent for holding the scanning rail shell in both of its rocked positions;

FIG. 10 is a reduced, fragmentary, sectional view taken along a line substantially corresponding to the line 10—10 in FIG. 2 and shows the structure for programming the voting machine to set it up for operation by the voter according to his classification;

FIG. 11 is a fragmentary, sectional view taken along a line substantially corresponding to the line 11—11 in FIG. 10 with certain parts shown in phantom to facilitate the explanation of the invention;

FIG. 12 is a diagrammatic and perspective view illustrating the party vote mechanism by which the voter may cast his votes for all of the candidates of a particular political party;

FIG. 13 is an enlarged, fragmentary, perspective view illustrating the office stop pin and its associated support strip; and

FIG. 14 is a fragmentary, sectional view illustrating an alternative construction of the scanning rail which may be employed if the programming for partly classification is not desired.

Referring now to the drawings and first to FIG. 1, one form of the voting machine of the present invention is there identified generally by the reference numeral 20

and comprises a substantially enclosed housing 21 formed by a number of panels locked together in any suitable manner as, for example, by means of interlocks and controlled by key operated locks such as those indicated at 22 and 23 on the upper and lower panels 21a and 21b respectively, of the housing. In the event that the voting machine breaks down during the course of an election, or if for any other reason, access may be desired to the interior of the housing 2, one or more of the panels may be removed by unlocking the appropriate key operated lock or locks.

The housing 21 defines an upper, generally vertically extending voting panel section identified by the reference numeral 24 and a lower ballot or card handling section 25 extending forwardly from the upper section and forming a relatively low shelf 29 through which extend the manually operated controls for the machine. In the form of the invention shown in FIG. 1, the selections made by the voter are adapted to be recorded or registered upon a ballot paper or card with all of the cards or papers being collected for subsequent transport to a central counting or tabulating station where the results of the election may be computed very rapidly by running the ballot cards through conventional punch card controlled counting or tabulating machines. In the operation of the machine shown in FIG. 1, each voter is provided with a ballot card 26, which may be of the type customarily used in tabulating or computing operations, and this card is inserted into the voting machine 20, for example, through a card receiving opening 27 provided at one side of the machine. The ballot card 26 is inserted into a card receiving and punching mechanism indicated generally by the reference numeral 28 and is held in fixed position therein while the voter makes his selections upon the front panel of the upper section 24.

In accordance with an important feature of the present invention, the front face or panel of the upper section 24 is made up of a plurality of side by side vertically extending columns 30a, 30b, 30c, etc. While eight vertical columns are shown, it will be apparent that this is merely for illustration since in actual practice any desired number of columns may be used. The ballot card 26 contains a number of lengthwise columns equal in number and respectively corresponding to the columns 30a, 30b, 30c, etc., of the voting panel.

As is best shown in FIGS. 2 and 4 of the drawings, each of the columns 30a, 30b, etc. comprises an elongated member preferably formed of an extruded material such as aluminum. The extrusion is such that each column comprises a central body portion 32 having an inwardly extending, longitudinal rib 33 and a laterally extending shoulder 34. The column further comprises a forwardly and longitudinally extending flange or leg 35 at one side and a second forwardly extending leg 36 extending along the entire length at its other side. A channel 37 formed by elongated recesses 38 and 39 respectively formed in the legs 35 and 36 receives a printed or written candidate strip 40 containing different offices or propositions to be decided by the voter. Thus, for example, if the election is a national election, this strip may contain an office title such as "President" and therebeneath may appear the different candidates competing for this office. The office title and the candidates for the office will be referred to hereinafter as an "office group." However, it should be understood that the term "office group" may also refer to propositions on which a yes or no answer is required as, for example, on bond issues, constitutional amendments or the like. Each of the candidate positions or voting positions in each office group will be referred to hereinafter as a selecting position. Each of the channels 37 may also receive a transparent cover 41 overlying the printed candidate strip 40 for the purpose of preventing the latter strip from being marked or damaged by the voter using the machine.

A dove-tailed groove 36a is provided along the side

of the leg 36 for receiving an elongated strip 42 having a series of vertically spaced stop receiving openings 45 (FIGS. 6, 7, 12, and 13) therein accommodating office stops 46 which divide the different office groups of each column. As is best shown in FIG. 13, each office stop comprises a pin having a stem 31a extending through one of the openings 45 and protruding outwardly beyond the strip 42 and laterally of the column. The head 31b of the office stop seats within a countersunk recess 45a encircling the opening 45 thereby permitting vertical movement of the strip 42 within the groove 36a for a purpose which is described more fully below. The leg 36 is further provided with an elongated, longitudinally extending guide channel 47 for accommodating one or more voting keys or selectors 48 which are slidable along the column to permit the voter to make his selections.

To consider the operation of the voting machine of the present invention, let it be assumed that the column 30a contains two office groups, namely, an office group in which the voter must select between candidates A, B, C, and D and a second office group in which the voter must choose between candidates E, F, G, and H. Let it be further assumed that the voter is entitled to vote for only one of the four candidates in each office group. Thus, under these conditions, the candidate strip 40 inserted into the receiving channel 37 of the column 30a will contain at the top a first office title listing the title of the office for which the candidates A, B, C, and D are running and, in addition, will contain beneath this first office title four selecting positions respectively listing the four different candidates. Below the first office group will be a second office title and four selecting positions listing the four different candidates competing for the second office. A pair of office stops 46a and 46b are inserted within appropriate openings 45 above and below the first office group with the stop 46b being provided at a position adjacent to but immediately below the bottom selecting position containing the name of the candidate D. The upper stop 46a lies above the selecting position for the candidate A and is separated therefrom by one additional position. A voting key 48a is adapted to slide along the column 30a between the two stops 46a and 46b but obviously this key cannot pass either of the stops. The key may be moved from a neutral or non-voting position located adjacent to the upper stop 46a to any one of the four selecting positions within the first office groups and as the key moves along the column an outer pointer or indicator 49 thereon passes over the candidate titles A, B, C, or D. When the key reaches the position of the candidate selected by the voter it is released. Since the voter is provided with only one key for the first office group, he may, of course, select only one of the four candidates and, as a consequence, it is not necessary to provide an inter-lock arrangement for preventing further voting in this office group. A similar situation exists in the second office group of the column 30a where a second voting selector or key 48b is mounted for sliding movement along the column between the stops 46c and 46d. The number of selecting positions available in each of the columns is, of course, determined solely by the height of the column and the space occupied by each selecting position. Obviously, any suitable number of selecting positions may be provided but in one form of the present invention, thirty such positions were selected although, to simplify the illustration, a lesser number is shown in FIG. 1. The selecting positions of the columns 30a, 30b, 30c, etc. are horizontally aligned to form different horizontal rows on the front panel of the voting machine with each row corresponding to a transversely extending row of punch positions on the ballot card.

In cases where the voter is permitted to exercise more than one choice in a particular office group, as for example, in the office group of the column 30e, several keys may be provided. In the latter office group, the voter is permitted to select between any three of six candidates I,

J, K, L, M, and N. This selection is, of course, made by moving each of three keys 48c, 48d, and 48e from their neutral positions adjacent the upper office stop 46e to selecting positions adjacent the names of the candidates selected, the movement of the three keys obviously being limited by the lower stop 46f. If cumulative voting is not permitted, the names of the candidates, I, J, K, L, M and N will appear only once and, hence, only one vote may be cast for any one candidate. However, if cumulative voting is permissible, that is, if the voter may cast more than one of his votes for a single candidate, then the names of the candidates will be listed in each office group more than once. In the case illustrated in column 30e, if the voter is permitted to cast all three of his votes for one candidate, then the name of each candidate is listed three times and, if the voter so desires, he may cast three votes for his chosen candidate by moving the three voting keys to positions respectively adjacent the three listings of that particular candidate. After the voter has moved all three of the keys 48c, 48d and 48e to a selecting position, he cannot, of course, cast additional votes for other candidates and, hence, over-voting is prevented without the use of elaborate interlocks between the three voting keys.

As is shown in FIGS. 3 and 4, the voting keys are held in the neutral and selecting positions by detent means 51 associated with each of the columns. This detent means may take the form of an elongated continuous strip having one end 51a received within a longitudinally extending channel 33a formed in the rib 33 with the strip being secured within this channel in any suitable manner, as for example, by means of spaced screws (not shown). An insulating strip 44 is preferably provided for electrically isolating the strip 51 from the extruded column since the strip is required to conduct electrical current as described below. The elongated strip contains a plurality of laterally extending detent fingers 52 extending outwardly from the end 51a with each finger carrying at its outer end a key engaging portion 53 (FIGS. 2, 3, 4 and 5). As is best shown in FIGS. 3, 6, and 7 of the drawings, each of the key engaging portions 53 is bent to form a key holding notch 54 and a wiping finger 55. Each detent finger extends outwardly from the continuous end 51a for a distance such that its key engaging portion 53 is disposed in the path of sliding movement of the voting keys on the column. The detent fingers are normally flexed or biased to occupy the position shown in FIG. 4 (and also shown for the columns 30a and 30b in FIG. 2). When a voting key is slid along the column to move over a detent finger, the finger is flexed inwardly and if the key is stopped at a selecting position, it seats within the key holding notch 54 and is thus resiliently held at the selected position with the detent finger being disposed as shown in column 30c in FIG. 2. To provide a detent for each selecting position on the voting panel, the detent fingers 52 are vertically spaced apart so that the notch portions 54 of adjacent fingers are separated by a distance corresponding to the width of one of these selecting positions and the detent fingers are so oriented with respect to the stop receiving openings 45 that when a voting key is seated against an office stop 46, it is also seated within a notch 54 on a detent finger.

Turning now to the construction of the voting key 48 and referring particularly to FIG. 5 of the drawings, it will be observed that this key or selector may comprise a generally rectangularly shaped body member having the pointer 49 referred to above extending laterally outward therefrom to overlie a flange 50 on the column. The latter flange extends loosely through a guide channel 60 formed in the key to permit the sliding movement of the key along the column but, at the same time, to prohibit removal of the key by the voter and also to limit lateral key movement. A rib 61 on the pointer portion of the key fits within the slot 47 of the column leg to complete the assembly. The rearwardly extending portion of the voting key is provided with a detent operat-

ing tooth 62 protruding rearwardly from the body portion of the key and having curved shape to facilitate movement of the keys past the detent fingers 52.

For the purpose of permitting assembly of the keys and the stops on the column during programming prior to the election, each column is mounted for pivotal movement about a vertical axis upon a pivot rod 63 extending vertically through the rib 33 and into suitable rod receiving openings formed in fixed upper and lower frame members (not shown) of the housing 21. Of course, the rod 63 need not extend entirely through the rib 33 since, in the alternative, outwardly extending pins could be provided at both ends of the column. In order to permit the columns to be pivoted outwardly for the purpose of programming, the upper and lower panel members 21a and 21b may be removed by operation of the key operated locks 22 and 23 whereupon each column may be turned in a counterclockwise direction from the position shown in FIG. 2 to that shown in FIG. 4. The programming is started by pivoting all of the columns outwardly beginning with the column at the extreme right side of the machine as viewed in FIG. 1 whereupon the stops and the selectors or voting keys may be inserted in the proper order. Thus, to program the column 30a described above, the candidate strip 40 and transparent cover 41 for that column are slipped into the channel 37 and the stop 46d is inserted at the proper position below the lowermost office group whereupon the voting key 48b is slid onto the column by dropping it from the top. This is accomplished by placing the voting key channel 60 over the flange 50 and sliding the voting key downwardly over the detent fingers 52 and along the column. The stop 46c is next inserted at the proper position for limiting the upward movement of the key 48b. The lowermost stop 46b of the upper office group is then assembled and the voting key 48a is placed on the column in the manner previously described. Finally, the office stop 46a is placed in position to limit the upward movement of the key 48a. After all of the columns have been properly programmed in the manner described, they are pivoted back to the positions shown in FIG. 2 beginning with the column 30a at the left side of the machine. The inward or clockwise pivoting movement of the column 30a is limited by engagement of the voting keys of this column with a vertical angle brace 65 (FIG. 2) extending along the left side of the voting panel as viewed in FIG. 1. The inward turning of the column 30b is limited by engagement of its keys with the shoulder 34 on the channel 30a and so on. After all of the columns have been programmed or set up and pivoted inwardly, the panels 21a and 21b are again locked in position and, since these panels respectively overlie the upper and lower ends of all of the columns, the columns cannot be pivoted outwardly during the course of an election.

After the voter has made his selections upon the voting panel of the machine, his choices are adapted to be recorded or registered as, for example, by punching or otherwise marking the ballot card 26. The registering operation is initiated by the actuation of a manually operated "Vote" switch 70 the handle or knob for which is accessible above the shelf 29. The switch 70 is operated by the voter as soon as he has completed his selections and is effective to complete an electrical circuit (not shown) to a drive motor 71 having its output shaft connected through suitable reduction gearing and through a sprocket and chain arrangement 72 to drive a scanning mechanism indicated generally by the reference numeral 73. The scanning mechanism is swept along the rear of the voting panel first in a sensing or vote detecting direction and remains at the bottom of the panel until it is returned at the start of the next voting cycle by the insertion of a properly positioned ballot card as is disclosed in copending application Serial No. 74,887 filed simultaneously herewith by Stanley W. Wilcox and Edward J. Crossland which application is assigned to the same as-

signee as the present invention. During the return sweep of the scanning mechanism 73, the voting keys are all returned in a manner described in detail below from their selecting positions to their neutral positions ready for the next voter's selections.

In the form of the invention illustrated in the drawings, the scanning mechanism 73 begins its sensing or vote detecting sweep at the top of the voting panel section 24 and moves downwardly along the rear of the front panel until it engages a lower limit switch 74 at which time the drive to the motor 71 is interrupted. When the scanning mechanism is moved upwardly to return to its original position, an upper limit switch 75 is engaged to stop the motor drive. It should be apparent that by appropriate changes in design the sensing sweep could begin at the bottom of the panel although in this case the voting keys would be in their neutral positions when they were located adjacent the lower stop of each office group.

The mechanical drive for the scanning mechanism 73 extends from the output shaft 72a of the sprocket and chain 72 to a pair of sprocket and chain drives including vertically extending chains 76 and 77 located at opposite sides of the voting machine. The scanning mechanism itself comprises a horizontal rail 80 formed by an outer shell 81 encircling an inner shaft or rod 82. The opposed ends of the inner shaft extend slightly beyond the ends of the shell to permit the fixed, non-rotating mounting of the shaft ends upon carriage assemblies 83 and 84 respectively carried by the chains 76 and 77. The carriage assemblies are fixedly secured to the chains and are guided for vertical movement within suitable fixed guide channels provided along the sides of the voting machine housing 21, as indicated at 85 in FIG. 2.

Since the voting keys are retained in their voting positions on the front panel following completion of the vote registering operation, it is desirable, for the purpose of preserving the secrecy of the ballot, to cover the panel and the keys so that the key positions cannot be detected by the next voter using the machine. Thus, in accordance with another important feature of the present invention there is provided a flexible curtain or cover 90 which is rolled on and off a supply rod 91 suitably mounted for rotation within a curtain containing chamber 92 (FIG. 3) at the top of the voting panel section 24. The rod 91 may be spring wound in a manner similar to an ordinary curtain rod. The curtain passes out of the chamber 92 through an elongated horizontal slot 93 and has its end affixed to a horizontal rod 94 supported at its opposed ends on the carriages 83 and 84. More specifically, the opposed ends of the rod 94 are affixed to the outer ends of brackets 95 and 96 which have their inner ends secured to the carriages 83 and 84, respectively. The brackets 95 and 96 extend through vertical guide slots 97 and 98, respectively, which extend along the opposed sides of the voting panel as is shown in FIG. 3. The rod 94 is spaced outwardly from the panel by sufficient distance to permit the rod and the cover to pass over the voting keys 48 without moving them. As the scanning mechanism 73 moves downwardly, the cover 90 is pulled from the supply chamber 92 and is drawn over the voting panel and, hence, when the scanning rail 80 reaches the bottom of its sweep the panel is completely covered. The cover material is sufficiently rigid to prevent detection of the positions of the voting keys by feeling along the cover and, to this end, may be formed of elongated metal strips secured together in side by side relationship to form a flexible unit or, in the alternative, it may be formed by a very heavy fabric. In any event, the voter approaching the machine to cast his vote is unable to detect the voting key positions either visibly or otherwise. When the scanning mechanism 73 is raised the flexible cover 90 is retracted into the chamber 92, but during the raising of the cover the voter is still not able to determine the previous voter's choices since the rod 94 and, hence, the lower end of the cover are disposed slightly below the

key restoring mechanism on the scanning rail so that the voting keys are all restored to their neutral positions adjacent the upper stops of their office groups before these keys become visible to the voter. When the panel is fully uncovered all of the voting keys appear in their neutral positions.

For the purposes of detecting the positions of the actuated voting keys, i.e. the keys which have been moved from a neutral position to a selecting position, the outer shell of the rail 80 carries a plurality of spaced apart wipers 100a, 100b, 100c, etc. there being one such wiper for each of the columns 30a, 30b, 30c, etc. Each wiper comprises a conducting ring 101 shaped as shown in FIGS. 3, 6, 7 and 8 with diametrically opposed outer raised conducting areas 101a and 101b and similarly opposed inwardly bent depressed regions 101c and 101d. The depressed regions 101c and 101d of each ring embrace the shell 81 and are attached thereto by suitable fasteners 102. The wipers 100a, 100b, 100c, etc. are so spaced longitudinally along the scanning rail that each wiper is disposed to engage the key engaging portions 53 of any inwardly flexed detent fingers 52 along the columns associated with that wiper. The wipers are electrically isolated in any suitable manner as, for example, by forming the shell 81 of insulating material. During the downward sweep of the scanning mechanism 73 the conducting rings 101 occupy the position shown in FIG. 3 so that the raised area 101a contacts the wiping finger 55 of each inwardly flexed detent finger 52. The raised area 101a does not engage those detent fingers 52 which have not been flexed inwardly. It will be recalled that the detent fingers 52 are in their flexed positions only when a voting key 48 is seated within their notch portion 54 and, hence, only those fingers which are holding a voting key will be contacted by the rings 101. During the downward sweep of the scanning mechanism 73 the raised area 101b of each conducting ring 101 is disposed to engage or wipe along a conducting strip extending vertically of the voting machine behind each column provided that the strip is properly positioned to engage the ring. In the latter connection, the contact strips, which bear reference numerals 103a, 103b, 103c, etc. are adjustably mounted upon a common insulating support panel 104 mounted at the rear of the housing 21 for limited movement in a direction extending transversely of the columns and, hence, these contact strips may be individually moved out of engagement with the rings 101 for a purpose described in detail below. For the present, let it be assumed that the conducting strips of all of the columns are disposed to engage the conducting rings 101. As the conducting rings sweep downwardly, at each position on the voting panel where a voting key has flexed a detent spring finger 52 inwardly, an electrical connection is made from the elongated detent strip 51 to the associated conducting strip through the conducting ring 101.

The engagement between the ring 101 and the detent strip 51, which occurs whenever the scanning rail encounters an actuated voting key, completes an electrical circuit to the punching mechanism 28 which punches a hole in the ballot card at a position corresponding to that of the actuated voting key. The punching mechanism is of the type described and claimed in copending application Serial No. 74,888 filed simultaneously herewith by Stanley W. Wilcox and assigned to the same assignee as the present invention and, hence, this mechanism will not be described in detail.

As is best shown in FIG. 8, when the scanning rail 80 approaches the end of its vote detecting sweep, a rigid shell turning arm 107 carried in fixed position on the shell 81 engages a fixed lower post 108 mounted within the housing so that the continued downward movement of the scanning mechanism is effective to turn 90° in a clockwise direction from the position shown in broken lines to that shown in solid lines. The scanning rail is thus conditioned for the upward key restoring sweep.

The turning of the shell moves the conducting rings 101 to positions where their raised areas 101a and 101b cannot engage the detent fingers 52 or the contact strips 103a, 103b, 103c, etc. during the return of the rail. However, when the shell is turned a plurality of key restoring fingers 109 mounted at longitudinally spaced positions on the shell are moved to positions where they engage the tooth 62 on the voting keys as the rail is raised. One such finger 109 is provided for each column and, as is shown in FIG. 6, it is effective to lift all of the voting keys in that column from the detent fingers 52 holding them in the selecting positions and to slide each key upwardly along the column until its upward movement is limited by the office stop. As is shown in FIG. 7, the continued upward movement of the rail after the key has reached the stop causes the rounded end of the spring finger 109 to ride over the tooth 62 thus permitting the finger to pass the voting key. After the voting keys have been raised to seat against their stops they are held in the neutral positions by engagement of their tooth portions 62 with the notch 54 of their associated detent fingers. When the scanning rail approaches the top of the panel at the end of its return sweep the arm 107 engages an upper fixed post 110 (FIG. 3) to turn the shell 81 from the key restoring position shown in FIGS. 6 and 7 back to the scanning position shown in FIG. 3.

As is shown in FIGS. 2 and 9, means are also provided for detenting the shell 81 both in its scanning position (FIG. 3) and in its key restoring position (FIGS. 6 and 7). The latter means may take the form of a bowed spring 111 encircling the shell 81 and secured in fixed position thereon by a suitable fastener 112. The spring 111 includes a flat portion 111a extending through a slot 113 cut entirely through the shell 81 to form an opening therein. The shaft 82 is provided with a pair of flat areas 114 and 115 located 90° apart, as shown in FIG. 9 and aligned with the slot 113. When the shell 81 is in the scanning position, the flat portion 111a of the spring 111 seats against the flat area 114 to hold the shell in position. When the shell is turned in a clockwise direction, as viewed in FIG. 9, at the bottom of the scanning sweep, the spring 111 is bowed outwardly as it rides over the corner 116 between the flat areas 114 and 115 and the flat portion 111a then seats against the flat area 115 to detent the shell 81 in the key restoring position. A similar action occurs at the top of the return sweep of the scanning, but the latter operation is not described in detail since it is believed to be obvious in view of the foregoing description.

Another important feature of the present invention resides in the use of the adjustability of the contact strips 103a, 103b, 103c, etc. on the insulating panel 104 and the transverse shifting of the latter panel to program the voting machine 20 for voters of different classification. Thus, in certain elections as, for example, in a primary election, the voter is eligible to vote only for the candidates of his own political party and it is, of course, essential that he be prevented from participating in the selection of candidates of other parties. Of course, this problem could be solved by providing at each voting station separate voting machines for the different political parties, thus avoiding the necessity for party classification programming, but this solution has several serious disadvantages. First, the use of separate machines permits persons other than qualified election officials to determine the classification or party of the voter and this may prove embarrassing. Second, and even more important, the use of separate voting machines is expensive and this may prove troublesome in jurisdictions where a relatively small number of voters cast their ballots at the different stations. Thus, it is desirable to employ one machine for all classifications of voters. The arrangement provided by the present invention for satisfying the latter desire requires that the voting machine be set up by an election official prior to use by each voter so that the voter may

participate in deciding only those issues for which he is eligible to vote. To set the machine for the voter's classification, the officials are required to move only one manually operated control indicated at 120 in FIGS. 10 and 11 and, hence, the classification programming may be accomplished very rapidly and with little effort.

To facilitate an understanding of the manner in which the classification programming is effected according to the present invention, a typical primary election will be considered where voters of three different classifications i.e. Democrat, Republican and Independent are eligible to participate. At this point, it should be observed that while the classification programming is described in conjunction with a primary election it may also be used in other special elections where only certain classes of voters are eligible to vote on particular issues presented as, for example, in cases where only real property owners may participate in a decision on a bond issue or the like. However, returning to the consideration of the typical primary election, let it be further assumed that all of the Republican candidates for the various offices are listed on strips 40 inserted into the channels 37 of the first three columns 30a, 30b, and 30c, that all of the Democrat candidates are listed on strips 40 carried by the columns 30d, 30e, and 30f and that all of the Independent candidates are listed on strips 40 on the last two columns 30g and 30h.

The voting keys for all of the columns are, of course, freely movable between the office stops and, hence, each voter could, if he so desired, move the voting keys in all eight columns even though he is eligible to vote on issues appearing on only two or three of them. According to the present invention provision is made for activating or energizing only those columns containing the issues within the voter's eligibility and for maintaining all of the remaining columns inactive. Thus, the ballot card 26 is punched only along its columns corresponding to the active voting panel columns and no other punches are made. Movement of the voting keys by the voter in inactive columns containing issues not within his classification is ineffective to punch the ballot card. Thus, even if the voter attempts to participate in the selection of candidates of political parties other than his own, he cannot do so because the latter selections are disregarded during the vote-registering operation.

The foregoing results, as was previously indicated, are accomplished by adjusting the contact strips 103a, 103b, etc. on the panel 104 and by moving the latter panel laterally of the voting panel by a limited amount. As is shown in FIGS. 10 and 11, the individual adjustment of the contact strips is accomplished by a plurality of manually operated spaced apart cams 121a, 121b, 121c, etc., each mounted upon a shaft 127 and these shafts are, in turn, supported for turning movement upon the frame of the voting machine. The cams are identical in construction and one is provided for each contact strip. Each cam includes a number of flat peripheral portions, one for each voter classification, and, hence, in the example assumed above where provision for three classes of voters, i.e. Democrat, Republican, and Independent, is desired, each cam has three flat peripheral portions 124, 125, and 126. The three flat portions 124, 125, and 126 are eccentric with respect to the axis of the shaft 127 and are relatively wide to permit the movement of the contact strips therealong in a manner described below. Each contact strip is biased into engagement with the periphery of its associated cam by means of a coil spring 128 having one end encircling the shafts 127 and having its other end hooked within a hook receiving aperture in a forwardly bent foot 129 on the contact strip. The strip is raised or lowered as the cam is turned to bring the different flat portions 124, 125, or 126 into engagement with the under-surface of the foot 129. Each of the shafts 127 extends forwardly from the panel 104 and below the voting panel columns to receive an indicating knob or handle (not shown) which may be provided with a pointer cooperat-

ing with a fixed indicator plate to indicate the position of the cam. Access to these knobs may be obtained by removing the panel 21b. Each of the cams is set by the election officials prior to the start of the election and their setting is not thereafter disturbed until the election has been completed.

The raising and lowering of the contact strips 103a, 103b, etc. in response to turning of the associated cams is accompanied by limited movement of the strips in a direction extending laterally of the voting panel. This lateral movement is effected by a pair of inclined elongated openings 130 and 131 in each strip cooperating with the spaced apart guide pins 132 and 133 secured in fixed positions on the panel 104. The pins 132 and 133 have enlarged heads overlying the contact strip in the vicinity of the slots in order to retain the strip adjacent the panel 104.

The lateral shifting of the panel 104 is accomplished in any suitable manner as, for example, by means of a gear rack 135 affixed to the panel near its lower edge in cooperation with the manually operated control 120 referred to above. In the form illustrated, the latter control comprises a member which is pivoted about a fixed pin 136 by turning a handle portion 137 and which includes a gear segment 138 meshing with the teeth of the rack gear 135. When the handle 137 is turned, the panel 104 is shifted within a pair of vertical guide channels 139 and 140 extending along opposite sides of the machine and also within horizontal guide channels 141 and 142, extending along the top and bottom of the panel. A portion of the lower channel 142 is cut away as is indicated at 143 in order to provide space for the rack 135.

Returning again to the primary election problem assembled above, the voting machine is illustrated in condition for voting by the second classification of voters, i.e. a Republican, since the first three contact strips 103a, 103b, and 103c are in position to engage the conducting wiper units 100a, 100b, 100c when the scanning rail moves downwardly during its vote detecting sweep, the conducting units being shown in phantom in FIG. 11 to indicate the engagement. The remaining contact strips 103d, 103e, 103f, 103g and 103h are shifted laterally to positions wherein none of them engages its associated wiper unit. Thus, when the scanning rail sweeps downwardly, an electrical circuit is completed to punch solenoids in the punching mechanism 28 whenever one of the wiper units 100a, 100b, or 100c encounters a detent finger 52 which has been flexed inwardly by the presence of a voting key. The electrical circuit is completed through the detent strip 51 of each column, through the wiper unit of that column and then through the associated contact strip. Thus, the punching mechanism 28 operates in a manner which will be evident in view of the aforementioned application Serial No. 74,888 to punch holes in the first three ballot card columns at positions corresponding to the locations of voting keys in selecting positions along the columns 30a, 30b, and 30c of the voting panel. None of the other voting panel columns are energized since their contact strips are offset from their conducting wiper units and, as a result, the punching mechanism 28 cannot punch holes in any of the ballot columns corresponding to these other voting panel columns. Thus, the Republican voter is effectively prevented from casting votes for any candidates except those of his own party, as listed on the columns 30a, 30b, and 30c.

If the next voter is a "Democrat," the election official gains access to the control 120 by unlocking a separate panel (not shown) in the shelf area 29. The latter control is moved to the Democrat position by turning the handle 137 in a clockwise direction as viewed in FIG. 11, thus shifting the insulating panel 104 to the right. Suitable indicating means are associated with the control handle 137 to indicate the three different voter classifications. As soon as the control 120 has been properly set to correspond with the voter's classification,

the access panel to this control is replaced and locked in position so that the control is not accessible to the voter. When the panel 104 is shifted to the right the contact strips 103a, 103b and 103c are moved out of the path of movement of their associated wiping units, and, hence, the first three columns 30a, 30b, and 30c are no longer active but, at the same time, the contact strips 103d, 103e, and 103f move into the path of their associated wiping units 100d, 100e, and 100f. The contact strips 100g, and 100h, of course, move to the right thus moving them further out of the path of the wiping units 103g and 103h so that the last two columns 30g and 30h remain inactive. As will be evident from the foregoing description, the ballot card 26 is punched only along the three columns thereon representing the voting panel columns 30d, 30e, and 30f, and, as a consequence, the Democrat voter can effectively exercise choices only on the issues in these three columns.

When an Independent voter is to use the machine the handle 137 is turned to its extreme counterclockwise position as viewed in FIG. 11 to shift the panel 104 to the extreme left whereupon the columns 30g and 30h are activated by movement of the contact strips 103g and 103h into the scanning path of the wiping units 100g and 100h. The other six columns are obviously not active.

The individual adjustments of the contact strips 103a, 103b, etc. are employed to determine which columns are active when the control 120 is in its different voter classification positions. Thus, by turning the cams 121a, 121b, etc. the election official may activate as many columns as he desires for any given voter classification. In a general election where all voters are eligible to vote on all of the propositions presented, all of the columns are rendered active by proper operation of the cams 121a, 121b, etc. and the control 120 is left in a fixed pre-determined position throughout the election.

In accordance with another important feature of the present invention, provision is made for permitting party voting wherein the voter may cast all of his votes for the candidates of his own political party. This mechanism is illustrated somewhat schematically in FIG. 12 and comprises a manually-operated lever 170, extending through a suitable opening 177 in the shelf area 29 and connected to a horizontal party vote bar or strip 172 through an appropriate mechanical connection represented by the broken line 173. The office stop support strips 42 of all columns in which party voting is desired are adapted to be detachably connected at their lower ends to the party vote bar 172. This detachable connection may be made in any suitable manner, but in the form shown it comprises a bracket 144 affixed to the bar and having an opening 145 therein for accommodating a pin 146 on the strip 172. A wing nut (not shown) or the like may be used to complete the connection, if desired. The opposed ends of the bar 172 are inserted within suitable channels (not shown) which permit limited vertical movement of the bar.

To cast a straight party vote, the voter moves the lever 170 from the neutral or non-party vote position shown in FIG. 12 so that the lever acts through the connection 173 to move the bar 172 vertically downward for a distance directly proportional to the amount of lever movement. All of the office stop strips 42 connected to the bar 172 are thus drawn downwardly through the dove-tailed grooves 36a whereupon the office stops 46 push the voting keys down along their columns from the neutral positions towards the selecting positions. The lever 170 may be moved from the neutral position to a number of different operating positions equal to the number of political parties participating. Thus, if the voting panel lists candidates for three parties, i.e., Democrat, Republican, and Independent, the lever is movable to three positions and is suitably detented at each. A removable indicator card 147 or the like may be provided on the shelf area 29

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so that the voter may throw the lever to the position indicating the party of his choice. This card is not accessible to the voter, but may be replaced prior to the next election thus permitting insertion of a different card changing the order of listing of the political parties so that the first lever operating position is not always associated with the same party. The mechanical connection 173 is so constructed and arranged that the movement of the lever 170 from the neutral position to the first party position is sufficient to move all of the office stops a distance exactly equal to one selection position on the voting panel. It will be recalled that the voting keys are all in their neutral positions when the voter approaches the machine and, hence, when the office stops move a distance equal to one selecting position in the manner described they move all of the keys to the selecting position immediately below the neutral position. The voting machine is so programmed that all of the candidates of the first political party, i.e., the Democrat party, are listed immediately below the neutral position. Thus, when the party vote lever 170 is thrown to the first party position all of the voting keys are moved in unison to positions adjacent the candidates of that party. The party vote lever 170 is then returned to the neutral position. The voting keys may then be moved individually if the voter desires to change his vote within one or more of the office groups. Thus, if the voter desires to cast his votes for a large majority of the candidates of a particular political party, but desires to split his ballot to vote for a few candidates of other parties, he will save some time and effort by using the party vote lever to move all of the voting keys in unison and by then individual moving the voting keys of the office group within which he wishes to split his ballot.

Movement of the party vote lever from the neutral position to the second party position, that is, to the position indicated at R in FIG. 12 is effective to cause the office stops to move all of the voting keys from their neutral positions through a distance exactly equal to two selecting positions. Thus, if all of the Republican candidates are listed in the second selecting position below each neutral position, the described movement is effective to move the voting keys to positions adjacent all of the Republican candidates. The movement of the party vote lever 170 to the third party position, that is, to the position indicated at I, the voting keys are obviously moved to positions adjacent the names of the candidates of the third political party since these names appear at the third selecting position below each neutral position.

Certain issues, for example, bond issues, constitutional amendments, and the like, are not subject to decision by party voting and, hence, it is desirable to avoid movement of the voting keys for these issues when the party vote is cast. This is accomplished by disconnecting one or more of the office stop strips 42 from the bar 172 and by programming all of the non-party voting issues in the column or columns associated with these strips. For example, let it be assumed that all of the non-voting party issues are listed on the strip 40 of the column 30g and that it is therefore desired to exclude this column from the party vote. This is accomplished by removing/or disconnecting the strip 42 of the column 30g from the bar 172 and by raising it sufficiently to avoid interference with the vertical movement of the party vote bar. The strip 42 of the column 30g is then mounted in fixed position in any suitable manner as, for example, by use of a set screw 148 at the top of the strip threaded into a tapped opening in the column. The latter opening is so positioned that the strip 42 is raised by a distance equal to an integral number of selecting positions so that the office stops of the column 30g will remain in proper orientation with respect to the detent fingers 52 of that column.

Turning now to the operation of the voting machine described above and considering only a general elec-

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tion where all of the voting panel columns are active, it will be observed that the scanning rail is at the bottom of the voting panel when the voter approaches the machine and inserts his ballot card 26 through the opening 27 and into the punching mechanism 28. When the card is properly inserted the scanning mechanism moves upwardly to return all of the voting keys to their neutral or non-voting positions adjacent the upper stops of the office groups and to raise the cover 90. The card is indexed by suitable mechanism (within the punching mechanism 28) to hold it in fixed position while the voter makes his selections on the voting panel by operation of the voting keys 48, that is, by sliding the voting keys from their neutral positions to the desired selecting positions. Until the voter actuates the "Vote" switch 70 he is free to alter his selections in any desired manner. As soon as the voter is satisfied with his selections he actuates the switch 70 to complete a circuit to the electric motor 71, thus driving the chains 76 and 77 in a direction to begin the downward or vote sensing movement of the scanning mechanism 73. Provision may be made for punching each ballot card with holes identifying the voting station or precinct where the ballot is cast, thus permitting sorting of the ballots at the counting station in the manner described in the above-identified copending application Serial No. 74,888.

When the scanning mechanism 73 sweeps downwardly it senses or detects the voting keys selected by the voter and actuates the corresponding punches. Thus, if the voting keys in the first horizontal row are positioned as shown in FIG. 1, the first voted key encountered will be that located in the column 30b which is shown in a neutral or non-voted position adjacent the uppermost stop in that column. The fact that the voting key is in the neutral position may indicate either that the voter did not desire to cast his vote for any of the candidates in that particular office group, or, of course, that he inadvertently neglected to make a selection. In any event, a circuit is completed to the punch solenoid associated with the column 30b through the wiping unit 100b and the conducting strip 103b, thus moving a knife blade into position for making a punch as described in application Serial No. 74,888. If other voting keys were located in the first horizontal row, the associated solenoids would also be actuated but with the voting keys positioned as shown in FIG. 1, only the solenoid associated with the column 30b is energized. Soon after the circuit to the punch solenoid of the column 30b is completed, the scanning rail reaches a position where a circuit is completed to energize a driving solenoid (not shown) which is effective to actuate a mechanism for driving all of the actuated knife blades through the ballot card. The hole thus punched is, of course, indicative of a neutral or non-voted key but the tabulating machine at the counting station can be set to discount this particular hole and, as a result, no votes will be counted for any of the candidates in the first office group in column 30b. The circuit for energizing the driving solenoid may be completed in any suitable manner, as for example, by an arrangement of the type disclosed in copending application Serial No. 74,887 of the present inventor and Edward J. Crossland which application is filed simultaneously herewith and is assigned to the same assignee as the present invention. As there disclosed, the arrangement for energizing the driving solenoid includes a plurality of vertically spaced pins or switch operators 150 mounted on the panel 104 as shown in FIGS. 2 and 10. One pin or operator 150 is provided for each of the horizontal rows and these are suitably spaced to actuate the driving solenoid at the proper time to punch the holes in the ballot card. The pins 150 are effective periodically to engage and operate a switch 151 carried on the shell 81 of the scanning rail 80.

After the holes in the ballot card have been punched to correspond to the location of the voting key in the

first horizontal row, the ballot card is advanced one step by a suitable step card advance and return mechanism which may take any of the forms well known in this art. Thus, as is described in the above-identified application of the present inventor and Edward J. Crossland, the card advance circuit may include a stepping solenoid the circuit for which is completed by a switch 152 carried on the scanning rail. The latter switch is closed or actuated by means of vertically spaced apart pins or fixed actuators 153 mounted on the panel 104 there being one such pin for each of the horizontal rows. Each of the pins 153 is spaced slightly below the corresponding pin 150 for the same horizontal row so that the card advance is not actuated until the punching operation has been completed. As was previously indicated, when the switch 152 is closed a circuit is completed to a solenoid in the card advance mechanism, thereby moving the ballot card 26 to bring a fresh area of the card beneath the punching die of the punch mechanism 28. The scanning rail continues its downward movement until it reaches a position adjacent the second horizontal row of selecting positions at which time it detects the voting keys in this horizontal row which have been moved to a selecting position. With the voting keys positioned as shown in FIG. 1, only the voting key at the top of column 30c is in a selecting position and, hence, only the punch solenoid associated with the column 30c will be energized. In view of the foregoing description, it will be apparent that the next closure of the switch 151 as the rail 80 moves downwardly is effective to punch a hole in the ballot card at a position corresponding to the location of the top voting key in the column 30c. As soon as the hole in the ballot card has been punched, the switch 152 is again closed to advance the card one more step. The horizontal scanning rail then reaches the third horizontal row and encounters three actuated keys so that at the time three holes are simultaneously punched in the ballot card. The operation then continues in an obvious manner until the scanning mechanism 73 reaches the end of its sweep and engages the lower limit switch 74 whereupon the drive to the motor 71 is interrupted and, at that same time, a signal may be supplied to the step card advance and return mechanism to return this mechanism to its original position, thus conditioning the machine for receiving the ballot card of the next succeeding voter. When the shell 81 is turned at the bottom of scanning sweep the switches 151 and 152 are moved to positions where they cannot engage the pins 150 and 153, thereby to prevent operation of the punch mechanism 28 and the card advance apparatus during the return sweep of the scanning rail. The ballot card when fully advanced through the punching mechanism 28 may be deposited directly in a sealed ballot box or, in the alternative, this card may be picked up by a card advancing and allotting mechanism indicated generally by the reference numeral 160 which is effective to supply ballot cards to a sealed ballot box 161 in a manner described in detail in co-pending application Serial No. 74,886 filed by Guilbert M. Hunt and assigned to the same assignee as the present application.

An alternative arrangement of the scanning rail and associated components as illustrated in FIG. 14 for use in machines where the classification programming feature is not required. The mechanism there shown is generally similar to that described above but the outer shell, indicated at 181 has a polygon shaped periphery upon which are mounted a wiper 182 for engaging the inwardly flexed detent fingers 52. As is shown, the wiper 182 is so disposed that it does not engage those detent fingers which are not flexed inwardly. During the scanning sweep, the electrical circuit to the punch solenoid is completed from the detent strip 51 through the wiper 182 and through a ground connection on the rail with results which will be obvious from the foregoing descrip-

tion. When the rail reaches the bottom of the sweep the shell 182 is turned by engagement of a rigid finger 183 with a post (not shown) in the manner described above but in this case the shell is only turned 60° instead of 90° as before. When the shell 181 is turned to the position shown in broken lines in FIG. 14 the wiper 182 can no longer engage the inwardly flexed detent fingers but at the same time, key restoring fingers 184 are moved into position to lift the keys during the return rail movement in a manner which will be obvious. The key restoring fingers 184 are slightly offset from the wipers 182 and, hence, they do not engage the detent fingers 52 during either direction of sweep. The tooth 62 on the voting key is wide enough to permit engagement by both the detent fingers 52 and by the key restoring fingers 184. The rail also carries a wiper 185 which replaces the card advance switch 152 employed in the form of the invention described above. The wiper 182 is adapted periodically to engage vertically spaced pins 186 carried on a conducting strip 187, thereby to complete a circuit from a ground on the rail, through the strip 187 to the solenoid of the card advance mechanism each time that a pin 186 is engaged. When the shell 181 is turned at the bottom of the sweep the wiper 185 is obviously moved to a position where it cannot engage the pins 186 during the return sweep of the rail.

In view of the foregoing description, it will be observed that the apparatus described is effective to accomplish the enumerated objects of the present invention. The voting machine described is extremely simple in operation and may be constructed at relatively low cost. Elaborate mechanical interlocks between the voting selectors are unnecessary and, hence, the weight and size of the machine is considerably less than that of voting machines presently in use. The use of a scanning rail and an associated registering mechanism operated in synchronism therewith avoids excessive wiring or mechanical connections which would otherwise be required. Thus, the scanning arrangement contributes to the reduction in size, weight, and cost of the machine. The programming classification feature permits use of the voting machine both in general elections and in special or primary elections. The machine is very easy to set up for both types of elections and, hence, the election official can be readily instructed as to the procedure to be followed. The party vote feature wherein all keys are moved a fixed pre-determined number of selecting positions is a unique arrangement.

While particular embodiments of the invention have been illustrated and described, it will be apparent that many modifications will readily occur to those skilled in this art and it is, therefore, contemplated by the appended claims to cover any such modifications as fall within the true spirit and scope of the invention.

What is claimed is new and desired to be secured by Letters Patent of the United States is:

1. In a voting machine, the combination of a voting panel made up of a number of different side by side columns, a plurality of stop means adjustably but fixedly mounted upon each column for dividing each column into different office groups, a plurality of selectors mounted for manual sliding movement along each column from a neutral position adjacent one of the stop means to any desired one of a plurality of selecting positions within each office group, there being at least one selector for each office group, scanning means movable along said columns in one direction to determine the selecting positions to which a selector has been moved, said scanning means being movable along said columns in a reverse direction and including means for returning each said selectors from its selecting position to its neutral position when said scanning means is moved in said reverse direction, the return movement of said selectors being limited by said stop means, and a movable cover for said panel movable in synchronism with said scanning means for

covering said panel as said scanning means is moved in said one direction so that the voter's choices cannot be detected by the next succeeding voter using the machine.

2. The apparatus defined by claim 1 wherein the movable cover is moved in a direction to uncover the panel when the scanning means is moved in the reverse direction, said cover being so constructed and arranged that it maintains each selector covered until that selector has been moved against its limiting stop means.

3. In a voting machine, the combination of a voting panel made up of a number of different side by side columns, stop means adjustable along each column for dividing each column into different office groups, a plurality of selectors mounted for manual sliding movement along each column, there being at least one selector for each office group, detent means for holding each selector in any one of a plurality of selecting positions within each office group to enable the voter to make a selection, scanning means movable along said columns in one direction to determine the voter's selections, said scanning means being movable along said columns in a reverse direction and including means for moving each of said selectors out of its selecting position when said scanning means is moved in said reverse direction, the movement of said selector being limited by said stop means, and a movable cover for said panel movable in synchronism with said scanning means for covering said panel as said scanning means is moved in said one direction so that the voter's choices cannot be detected by the next succeeding voter using the machine.

4. The apparatus defined by claim 3 wherein the movable cover is moved in a direction to uncover the panel when the scanning means is moved in the reverse direction, said cover being so constructed and arranged that it maintains each selector covered until that selector has been moved against its limiting stop means.

5. In a voting machine of the type utilizing a ballot for recording the voter's selections, the combination of means defining a plurality of side by side columns each divided into a number of selecting positions, manually operable selectors in each column whereby the voter makes his selection at said selecting positions, means for simultaneously scanning all of said columns to determine which of the selecting positions has been selected by the voter, and a movable cover for said columns operated in synchronism with said scanning means for covering said selectors when said scanning means scans said columns, thereby to prevent detection of the voter's selections by the next succeeding voter, means for moving said cover to uncover said columns when the next succeeding voter begins his voting operation, and means for resetting said selectors so that the next succeeding voter can use the machine.

6. In a voting machine of the type utilizing a ballot for recording the voter's selections, the combination of means defining a plurality of side by side columns each divided into a number of selecting positions, manually operable means in each column whereby the voter makes his selections at said selecting positions, means movable along said columns in a first direction for simultaneously scanning all of said columns to determine which of the selecting positions has been selected by the voter, said scanning means being movable along the columns in the reverse direction, a movable cover for said columns movable in synchronism with said scanning means for covering said columns when said scanning means is moved in said first direction in order to prevent detection of the voter's selections by the next succeeding voter, said cover being moved to uncover said columns when the scanning means is moved in the reverse direction thereby to condition the machine to permit the voter's selections, and means for resetting said selectors so that the next succeeding voter can use the machine.

7. In a voting machine of the type utilizing a ballot for recording the voter's selections, the combination of a

housing comprising means defining a plurality of side by side columns each divided into a number of selecting positions, manually operable selectors in each column whereby the voter makes his selections at said selecting positions, a movable cover for said columns mounted upon said housing, means for raising and lowering said cover over the front face of said columns, said cover being raised at the start of the voting operation to permit the voter to make his selections and being closed at the completion of the voting operation to prevent detection of the voter's selections by the next succeeding voter, and means for resetting said selectors so that the next succeeding voter can use the machine.

8. For use in a voting machine, the combination which comprises a front panel made up of a plurality of unitary, elongated side by side columnar members, said members cooperating to form a series of parallel slots extending between immediately adjacent members of the panel, each such member having a channel extending along its front face for receiving a candidate strip listing different office groups to be voted upon, each member supporting a plurality of adjustable but fixedly positioned, spaced apart stop means respectively separating the different candidate groups, a plurality of voting keys, at least one for each group, mounted for sliding movement upon each columnar member within one of said slots and each having its sliding movement limited by said stop means, and a plurality of detents mounted upon each member for holding the voting keys in different positions along said member.

9. For use in a voting machine, the combination which comprises a front panel made up of a plurality of unitary, elongated side by side columnar members, each such member carrying on its front face a candidate strip listing different office groups to be voted upon, said members cooperating to form a series of parallel slots extending between immediately adjacent members of the panel, each member supporting a plurality of spaced apart stop means respectively separating the different candidate groups, a plurality of voting keys, at least one for each group, mounted for sliding movement upon each columnar member within one of said slots and each having its sliding movement limited by said stop means, and a detent means mounted upon each member for holding the voting keys in different positions along said member.

10. For use in a voting machine, the combination which comprises a front panel made up of a plurality of unitary, elongated side by side columnar members, said members cooperating to form a series of parallel slots extending between immediately adjacent members of the panel, each member supporting a plurality of spaced apart stop means dividing it into a plurality of office groups, a plurality of voting keys mounted for sliding movement upon each columnar member within one of said slots with at least one key being provided for each office group and a detent means mounted upon the rear of each member for holding the voting keys in different positions along said member.

11. For use in a voting machine, the combination which comprises a front panel made up of a plurality of unitary, elongated side by side columnar members lying immediately adjacent one another, said members cooperating to form a series of parallel slots extending between immediately adjacent members of the panel, each member supporting a plurality of adjustable, but fixedly positioned, spaced apart stop means dividing each member into a plurality of different office groups, and a plurality of voting keys mounted for sliding movement upon each columnar member within said slots with at least one key being movable in each of the spaces between adjacent pairs of said stop means.

12. In a voting machine the combination of a panel made up of a plurality of side by side unitary columns each containing a plurality of issues to be decided, said

columns lying immediately adjacent each other and having front faces lying substantially in a common plane to form said panel, adjacent columns cooperating to define elongated slots therebetween, a plurality of voting selectors, at least one for each issue, mounted for sliding movement along each column within the slots to selecting positions indicating the voter's choices, and a continuous elongated strip carrying a plurality of spring fingers mounted on the rear of each column for engaging the voting selectors to hold them in the selecting positions.

13. In a voting machine the combination of a panel made up of a plurality of side by side unitary columns each containing a plurality of issues to be decided, said columns lying immediately adjacent each other and having front faces lying substantially in a common plane to form said panel, adjacent columns cooperating to define elongated slots therebetween, a plurality of voting selectors, at least one for each issue, mounted for sliding movement along each column within the slots to selecting positions indicating the voter's choices, and a plurality of detents mounted on the rear of column in fixed positions for engaging the voting selectors to hold them in the selecting positions.

14. In a voting machine the combination of a panel made up of a plurality of side by side columns each containing a plurality of issues to be decided, a plurality of voting selectors, at least one for each issue, mounted for sliding movement along each column to selecting positions indicating the voter's choices, a continuous elongated strip carrying a plurality of spring fingers for engaging the voting selectors to hold the voting selectors in the selecting positions, electrically operated vote registering means associated with each column, for recording the voters selections, and means electrically connecting the strip of each column to its associated vote registering means.

15. In a voting machine, the combination of a panel made up of a plurality of side by side elongated unitary columns each mounted for pivotal movement about an axis extending parallel to its longitudinal axis, said columns lying immediately adjacent each other and having front faces lying substantially in a common plane to form said panel, adjacent columns cooperating to define elongated slots therebetween, each column being capable of being manually pivoted from a first position wherein its front face lies in the plane of the panel to a second position wherein the front face is misaligned with respect to the plane of the panel, manually operated means for locking all of the columns in their first positions, each column having means on its front face for receiving a strip listing different issues to be voted upon, each column further including a channel for receiving a plurality of voting selectors mounted for sliding movement along the column within an adjacent slot to selecting positions indicating the voter's choices on the different issues, said selectors being insertable into said channel and said strip being insertable into the receiving means when said locking means is released and when the column is pivoted to the second position, and means for preventing removal of the selectors from the channel when the locking means is effective to lock the columns in their first positions.

16. In a voting machine, the combination of a panel made up of a plurality of side by side elongated columns each mounted for pivotal movement from a first position wherein its front face lies in the plane of the panel to a second position wherein the front face is misaligned with respect to the plane of the panel, said columns lying immediately adjacent each other and having front faces lying substantially in a common plane to form said panel, adjacent columns cooperating to define elongated slots therebetween, means for locking all of the columns in their first positions, each column further including means

for receiving a plurality of voting selectors mounted for sliding movement along the column within an adjacent slot to different selecting positions, said selectors being insertable into the receiving means of their associated column when said locking means is released and when the column is pivoted to the second position, and means for preventing removal of the selectors from the receiving means when the locking means is effective to lock the columns in their first positions.

17. In a voting machine, the combination of a panel made up of a plurality of side by side elongated columns each mounted for pivotal movement from a first position wherein its front face lies in the plane of the panel to a second position wherein the front face is misaligned with respect to the plane of the panel, said columns lying immediately adjacent each other and having front faces lying substantially in a common plane to form said panel, adjacent columns cooperating to define elongated slots therebetween, means for locking all of the columns in their first positions, each column having means on its front face for receiving a strip listing different issues to be voted upon, each column further including a channel for receiving a plurality of voting selectors mounted for sliding movement along the column within an adjacent slot to selecting positions indicating the voter's choices on the different issues, said selectors being insertable into said channel and said strip being insertable into the receiving means when said locking means is released and when the column is pivoted to the second position, and means for preventing removal of the selectors from the channel when the locking means is effective to lock the columns in their first positions.

18. In a voting machine the combination of a plurality of side by side columns each containing therealong a plurality of issues to be decided, said columns cooperating to form a substantially planar panel, a plurality of voting selectors, at least one for each issue, mounted for sliding movement along the plane of said panel and along each column from neutral positions to selecting positions indicating the voter's choices, stop means adjustable along each column for dividing the column into the plurality of issues and for limiting the sliding movement of the selectors mounted thereon, each selector being located adjacent one of said stop means when in its neutral position, and a manually operated party vote mechanism for simultaneously engaging all of said selectors and moving them from their neutral positions through a predetermined number of selecting positions in order to vote for all of the candidates of a particular political party.

19. In a voting machine the combination of a plurality of side by side columns each containing therealong a plurality of issues to be decided, said columns cooperating to form a substantially planar panel, a plurality of voting selectors, at least one for each issue, mounted for sliding movement in the plane of said panel and along each column from neutral positions to selecting positions indicating the voter's choices, stop means adjustable along each column for dividing the column into the plurality of issues and for limiting the sliding movement of the selectors mounted thereon, each selector being located adjacent one of said stop means when in its neutral position, and a manually operated party vote mechanism movable from a neutral position wherein all of said selectors are disengaged and are individually movable to a position engaging all of said selectors and arranged to then move all of said selectors in unison from their neutral positions through a predetermined number of selecting positions dependent upon the political party selected, said mechanism being movable back to the neutral position after said selectors have been moved through said predetermined number of selecting positions.

20. The apparatus defined by claim 19 wherein latch means are provided for locking the party vote mechanism in the neutral position after it has returned thereto, thus

preventing operation of the party vote mechanism more than once during a voting operation.

21. In a voting machine, the combination of a voting panel made up of a number of different side by side columns; stop means adjustable along each column for dividing each column into different office groups; a plurality of selectors mounted for manual sliding movement along each column, there being at least one such selector for each office group; detent means for holding each selecting device in any one of a plurality of selecting positions within each office group to enable the voter to make a selection, said detent means including deflectable fingers deflected away from said panel by movement of a selector to one of the selecting positions, scanning means movable along said columns to determine the voter's selections; electrically operated registering means associated with each column for registering the voter's selections; an electrical circuit for connecting each registering means and its associated column, said electrical circuit including a plurality of elongated contact strips, one for each column, each extending parallel to and spaced from the associated column, means electrically connecting each strip to one of said registering means, a plurality of electrical contacts on said scanning means for respectively connecting each strip and the deflected detent fingers of each column, and means connecting the detent fingers of each column electrically together and to the registering means associated with that column; a common support for said contact strips; means mounting each strip for individual adjustment along said support in a direction transversely of the column to move each strip into engagement with its associated contact on the scanning means in order to render the column effective to actuate its associated registering means; the last named means being selectively operable to move each contact strip out of engagement with its associated contact on the scanning means to prevent actuation of the registering means connected to that strip; and manually operated means for shifting said support transversely of said columns to move all of said contact strips in unison, thereby to render effective only those columns containing office groups in which the voter is eligible to vote.

22. In a voting machine, the combination of a voting panel made up of a number of different side by side columns; a plurality of selectors mounted upon each column to enable the voter to make his selections; scanning means movable along said columns to determine the voter's selections; electrically operated registering means associated with each column for registering the voter's selections; an electrical circuit for connecting each registering means and its associated column, said electrical circuit including a plurality of elongated contact strips, one for each column, each extending parallel to and spaced from the associated column; a common support for said contact strips; means mounting each strip for individual adjustment along said support in a direction transversely of the column to render the associated column effective to actuate its associated registering means, the last named means being selectively operable to move each contact strip out of engagement with its associated contact on the scanning to prevent actuation of the registering means connected to that strip, and manually operated means for shifting said support transversely of said columns to move all of said contact strips in unison, thereby to render effective only those columns containing issues upon which the voter is eligible to vote.

23. In a voting machine, the combination of a voting panel made up of a number of different side by side columns; a plurality of selectors mounted upon each column to enable the voter to make a selection; scanning means movable along said columns to determine the voter's selections; electrically operated registering means associated with each column for registering the voter's selections, an electrical circuit for connecting each registering means and its associated column, said electrical circuit includ-

ing selectively operated means associated with each column for rendering that column effective to energize its associated registering means, and manually operated means operated in accordance with the voter's classification for rendering different groups of said columns effective to energize their associated registering means so that only those columns containing issues upon which the voter is eligible to vote are effective for any particular voter.

24. For use in a voting machine, the combination which comprises a front panel made up of a plurality of elongated side by side columnar members each providing a plurality of selecting positions formed into different office groups respectively representing the issues to be decided, said members cooperating to form a series of parallel slots extending between immediately adjacent members of the panel, a plurality of adjustable but fixedly positioned, spaced apart stop means mounted on each member and respectively separating the different office groups, a plurality of voting keys, at least one for each group, mounted for sliding movement upon each columnar member within an adjacent slot from a neutral position adjacent one of said stop means to a selecting position adjacent one of the selecting positions, and a plurality of detents mounted upon the rear of each member for holding the voting keys in different positions along said member.

25. In a voting machine, the combination of a voting panel made up of a number of different side by side columns each containing a number of selecting positions forming a plurality of office groups, a plurality of selectors mounted for manual sliding movement along each column to selecting positions selected by the voter, there being at least one such selector for each office group, detent means for holding each selector in the selecting position within each office group selected by the voter, a rail extending transversely of and movable along said columns, means for sweeping said rail along said columns first in one direction and then in the reverse direction, means for rocking said rail about its longitudinal axis at the completion of each sweep, sensing means effective to determine the voter's selections when said rail is swept in said one direction, and selector restoring means effective when said rail is swept in said reverse direction to engage all of said selectors to move them from the selecting positions selected, said restoring means being so disposed that it cannot engage said selectors during movement of said rail in said one direction.

26. In a voting machine, the combination of a voting panel made up of a number of different side by side columns, stop means adjustable along each column for dividing each column into different office groups, a plurality of selectors mounted for manual sliding movement along each column, there being at least one such selector for each office group, detent means for holding each selector in any one of a plurality of selecting positions within each office group to enable the voter to make a selection, a rail extending transversely of and movable along said columns, means for sweeping said rail along said columns first in one direction and then in the reverse direction, means for rocking said rail about its longitudinal axis at the completion of each sweep, sensing means effective to determine the voter's selections when said rail is swept in said one direction, and selector restoring means effective when said rail is swept in said reverse direction to engage all of said selectors to move them from the selecting positions selected, said restoring means being so disposed that it cannot engage said selectors during movement of said rail in said one direction.

27. In a voting machine, the combination of a voting panel made up of a number of different side by side columns, stop means adjustable along each column for dividing each column into different office groups, a plurality of selectors mounted for manual sliding movement along each column from a neutral position located adjacent one of the stop means to a selecting position, there being at least one such selector for each office group, a rail ex-

tending transversely of and movable along said columns, means for sweeping said rail along said columns first in one direction and then in the reverse direction, means for rocking said rail about its longitudinal axis at the completion of each sweep, sensing means effective to determine the voter's selections when said rail is swept in said one direction, and selector restoring means effective when said rail is swept in said reverse direction to engage all of said selectors to return all of them from the selecting positions to the neutral positions, said restoring means being so disposed that it cannot engage said selectors during movement of said rail in said one direction.

28. In a voting machine, the combination of a voting panel made up of a number of different side by side columns, a plurality of selectors mounted for manual sliding movement along each column from a non-voting position to a voting position, there being at least one such selector for each office group, a rail extending transversely of and movable along said columns, means for sweeping said rail along said columns first in one direction and then in the reverse direction, means for rocking said rail about its longitudinal axis at the completion of each sweep, sensing means effective to determine the voter's selections when said rail is swept in said one direction, and selector restoring means effective when said rail is swept in said reverse direction to engage all of said selectors to return all of them from the voting positions to the non-voting positions, said restoring means being so disposed that it cannot engage said selectors during movement of said rail in said one direction.

29. In a voting machine the combination of a plurality of side by side columns each containing different office groups respectively listing issues to be decided, a plurality of voting selectors, at least one for each office group, mounted for sliding movement along each column to selecting positions indicating the voter's choices, stop means adjustable along each column to divide the columns into the different office groups and limiting movement of

the selectors associated with each group, at least one of said groups containing a number of selectors mounted for movement along the same column to permit the voter to make an equal number of selections with said one group, and a manually operated party vote mechanism for simultaneously moving all of said selectors including the selectors of said one group through a predetermined number of selecting positions in order to vote for all of the candidates of a particular political party.

30. In a voting machine the combination of a plurality of side by side columns each containing different office groups respectively listing issues to be decided, a plurality of voting selectors, at least one for each office group, mounted for sliding movement along each column to selecting positions indicating the voter's choices, stop means adjustable along each column to divide the columns into the different office groups and limiting movement of the selectors associated with each group, at least one of said groups containing a number of selectors mounted for movement along the same column to permit the voter to make an equal number of selections with said one group, and a manually operated party vote mechanism movable from a neutral position to move all of said selectors including those of said one group in unison through a predetermined number of selecting positions dependent upon the political party selected, said mechanism being movable back to the neutral position after said selectors have been moved through said predetermined number of selecting positions.

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