Sept. 21, 1965 E. J. CROSSLAND ET AL 3,207,429

PUSH BUTTON CONTROL BOX FOR VOTING MACHINES

Filed Aug. 6, 1963 6 Sheets-Sheet 1

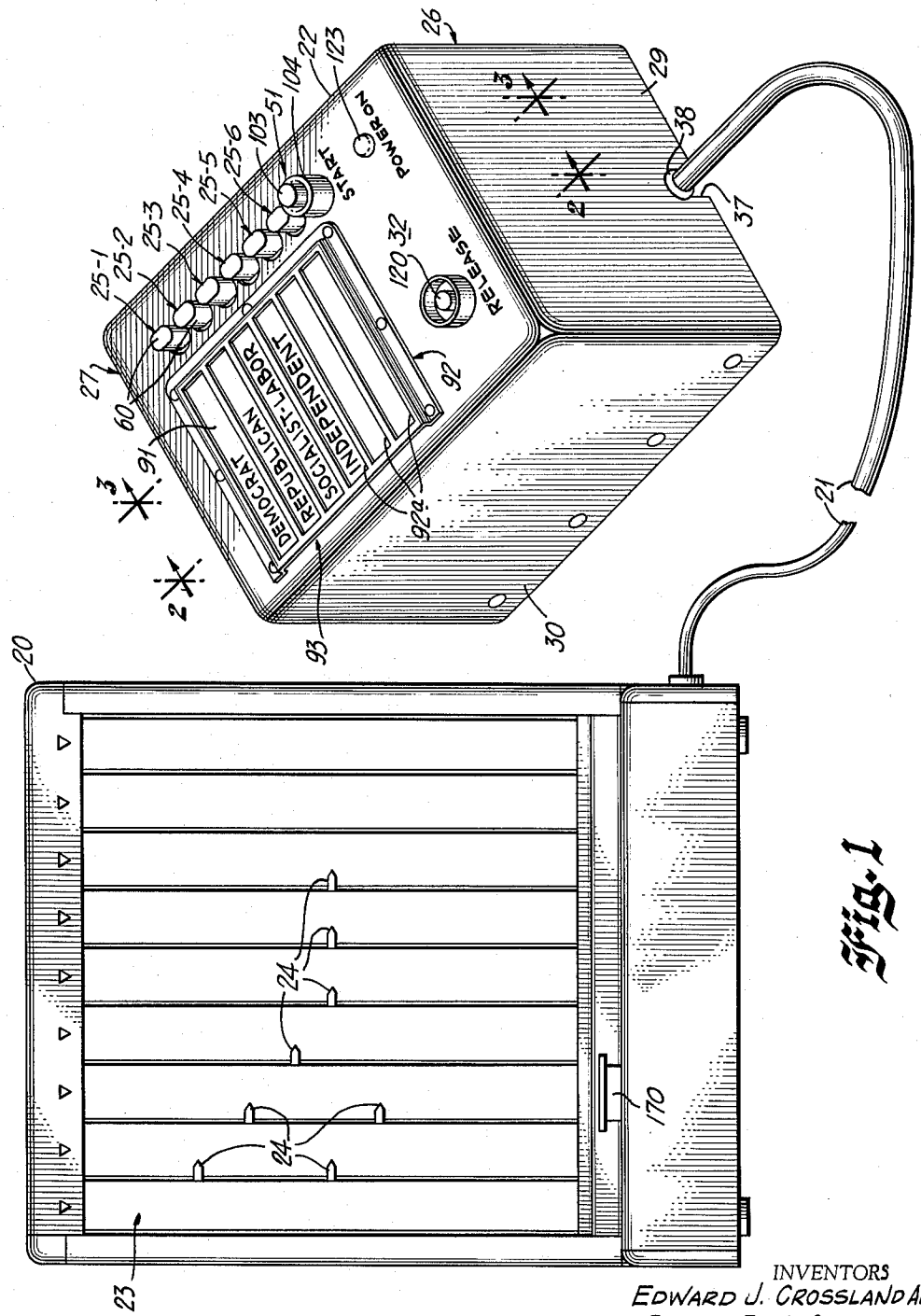


Fig. 1

INVENTORS
EDWARD J. CROSSLAND AND
BY ROBERT B. MCCASKILL

Mason, Kolehmainen, Rathbun and Wyss
ATTORNEYS.

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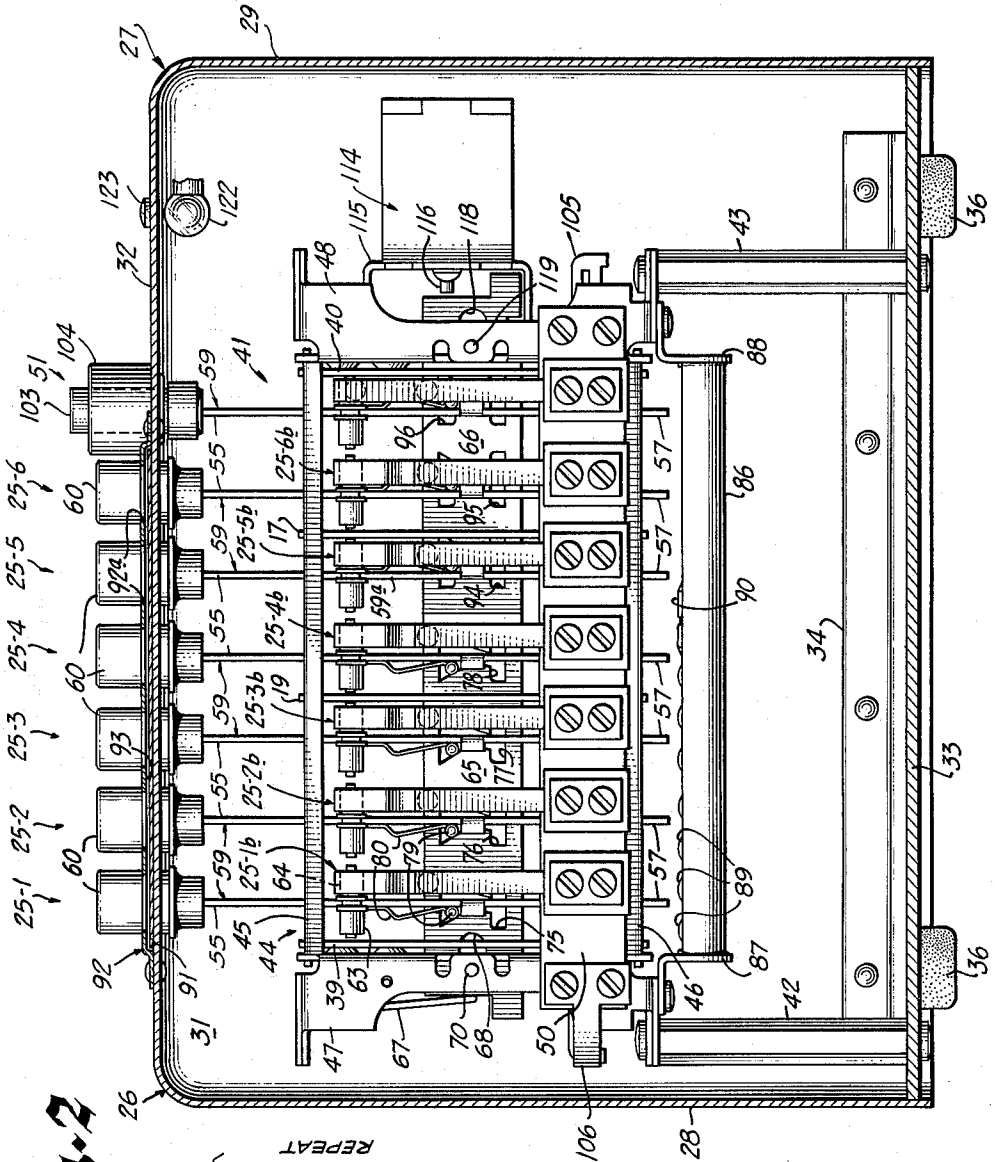


Fig. 2

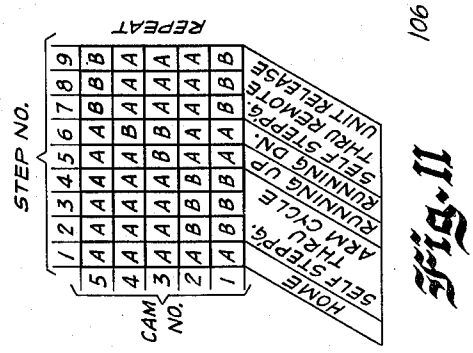


Fig. 11

INVENTORS
EDWARD J. CROSSLAND AND
BY ROBERT B. McCASKILL
Mason, Kolehmainen, Rathbun and Wyss
ATTORNEYS.

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PUSH BUTTON CONTROL BOX FOR VOTING MACHINES

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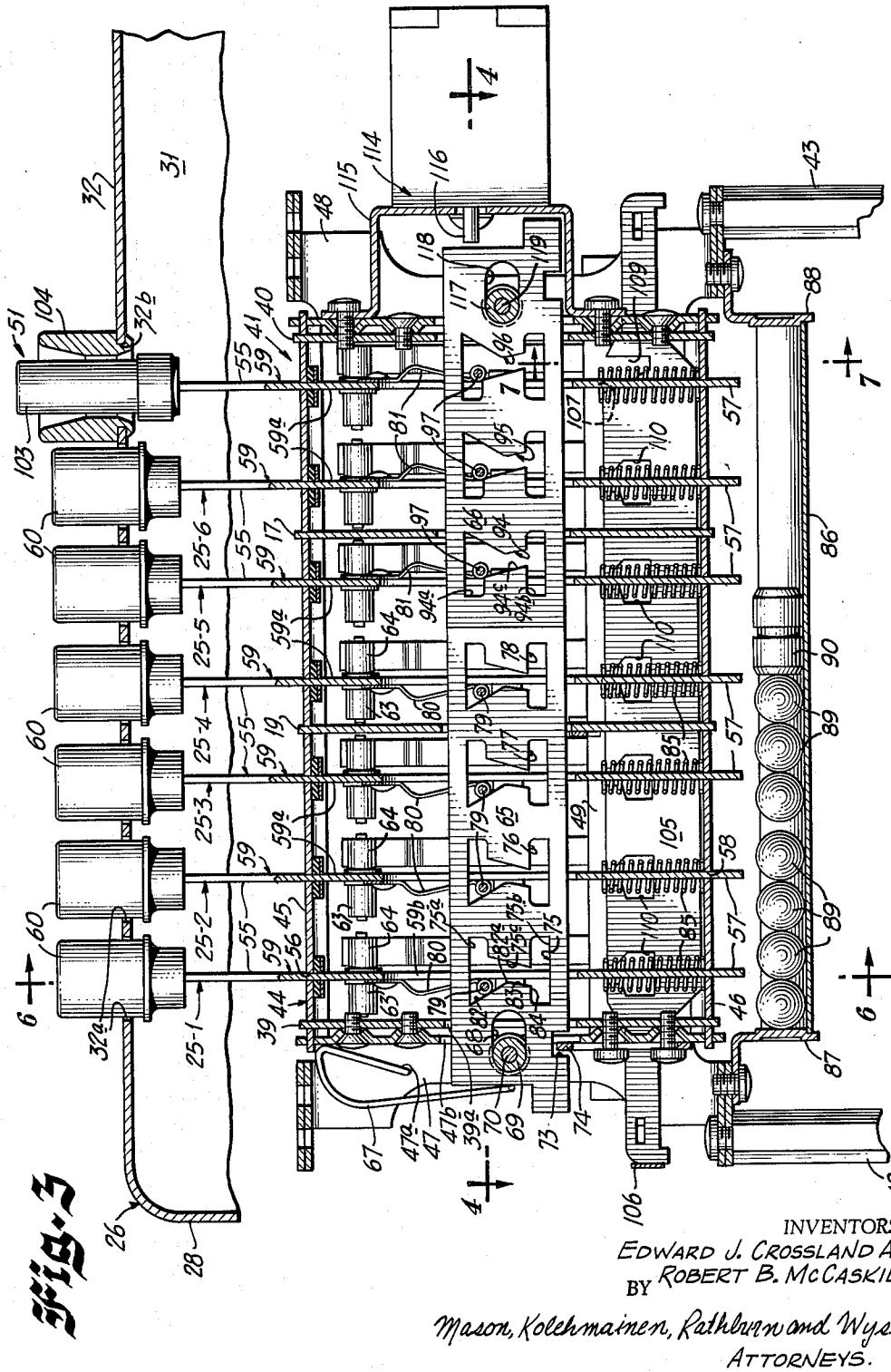


Fig. 3

INVENTORS
EDWARD J. CROSSLAND AND
BY ROBERT B. MCCASKILL

Mason, Kolehmainen, Rathburn and Wyss
ATTORNEYS.

Sept. 21, 1965 E. J. CROSSLAND ET AL 3,207,429

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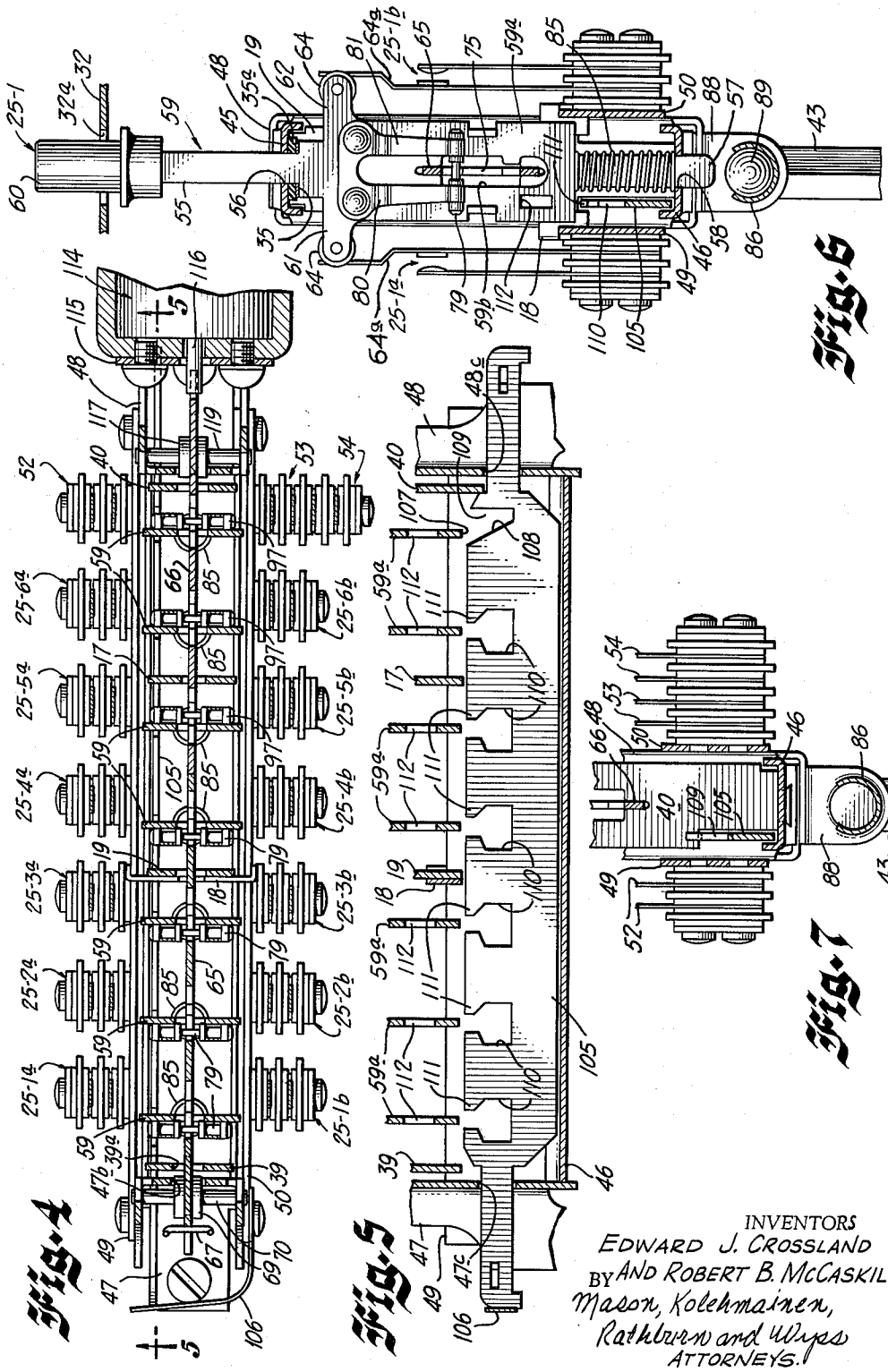


Fig. 4

Fig. 5

Fig. 6

Fig. 7

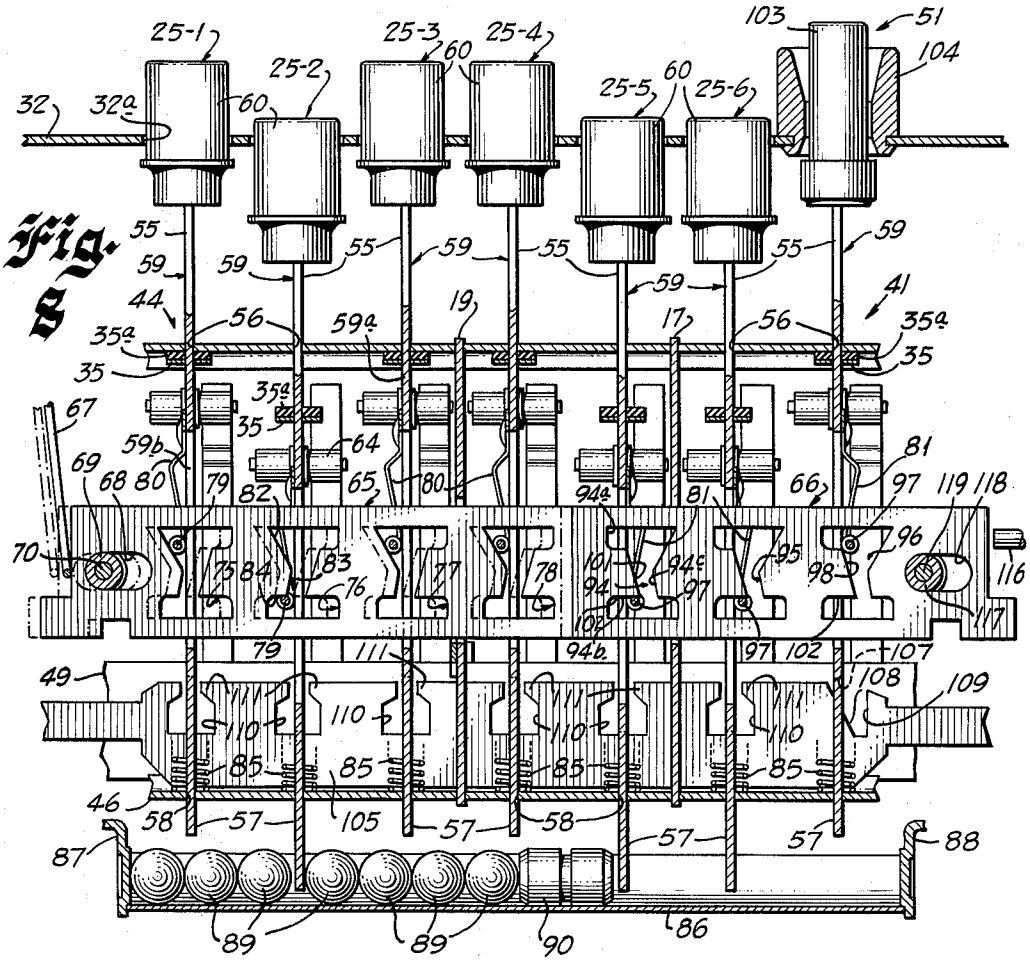
INVENTORS
EDWARD J. CROSSLAND
BY AND ROBERT B. MCCASKILL
Mason, Kolehmainen, Rathburn and Wyss
ATTORNEYS.

Sept. 21, 1965 E. J. CROSSLAND ET AL 3,207,429

PUSH BUTTON CONTROL BOX FOR VOTING MACHINES

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Fig. 8



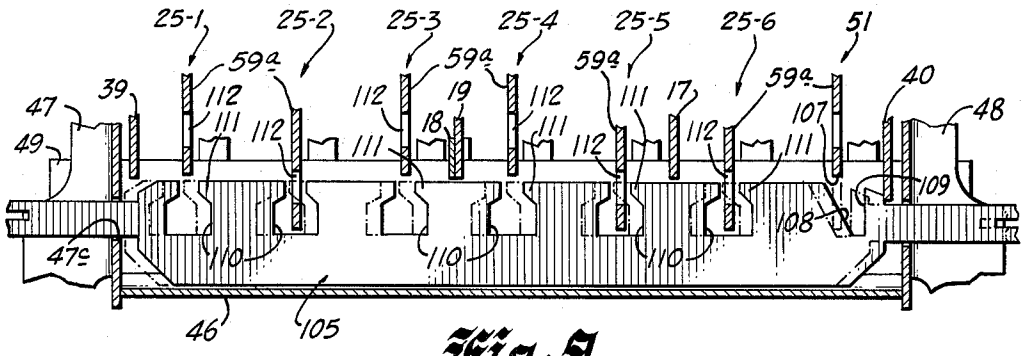


Fig. 9

INVENTORS
EDWARD J. CROSSLAND AND
BY ROBERT B. MCCASKILL
Mason, Kolehmainen, Rathbun and Wyss.
ATTORNEYS.

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PUSH BUTTON CONTROL BOX FOR VOTING MACHINES

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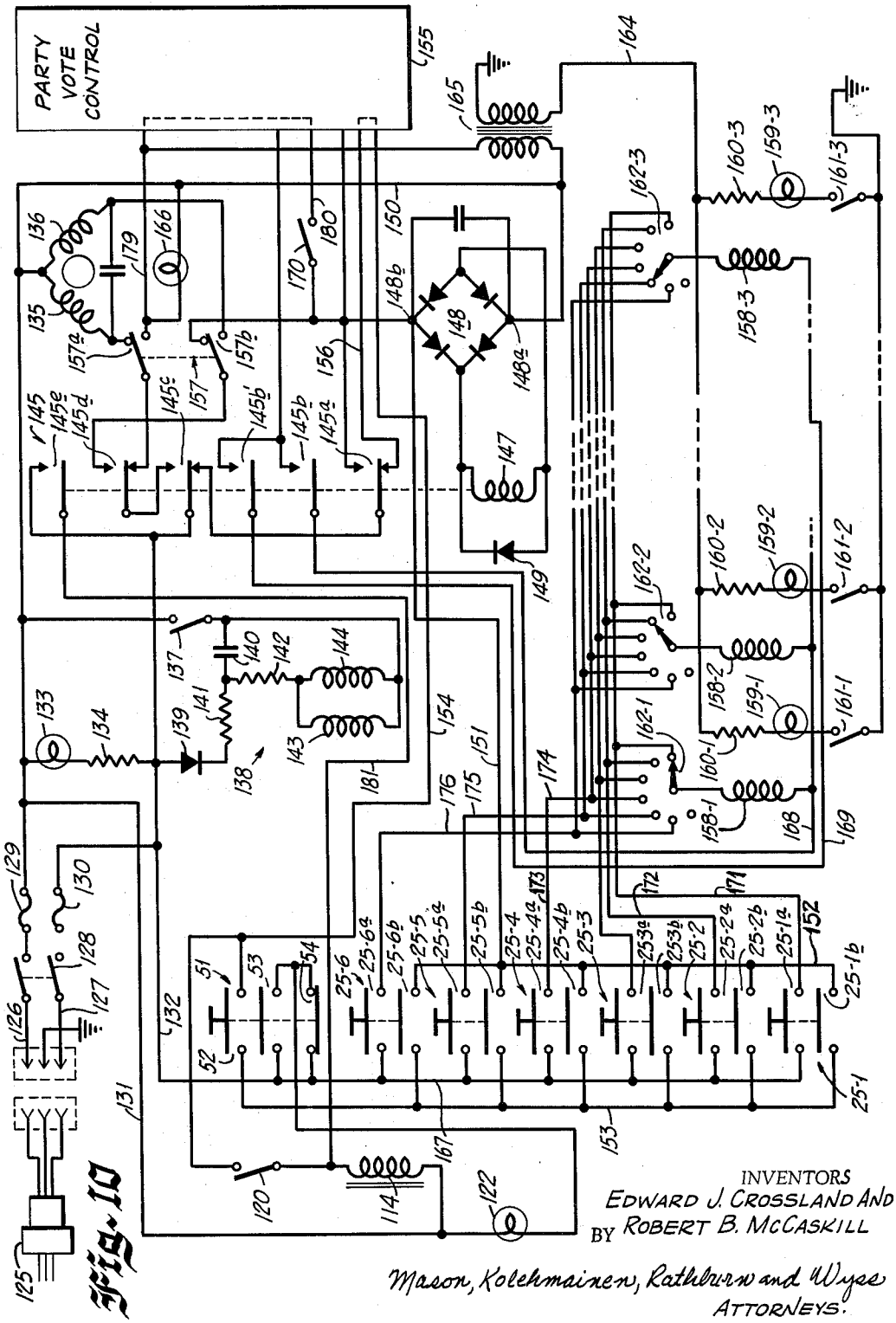


Fig. 10

INVENTORS
EDWARD J. CROSSLAND AND
BY ROBERT B. MCCASKILL

Mason, Kolehmainen, Rathburn and Wyss
ATTORNEYS.

United States Patent Office 3,207,429 Patented Sept. 21, 1965

3,207,429

PUSH BUTTON CONTROL BOX FOR VOTING MACHINES

Edward J. Crossland and Robert B. McCaskill, Tulsa, Okla., assignors to Seismograph Service Corporation, Tulsa, Okla., a corporation of Delaware

Filed Aug. 6, 1963, Ser. No. 300,304
18 Claims. (Cl. 235—54)

The present invention relates generally to voting machines and is more particularly concerned with new and improved apparatus for rendering the machine effective in accordance with the classification of the voter for use with voting machines of the type disclosed and claimed in United States Patent No. 3,098,607 and in copending application Serial No. 120,281, now Patent No. 3,108,744, both filed June 28, 1961, and both assigned to the same assignee as the present invention.

When a voting machine is to be used in special elections such as a primary election, the arrangement must be such that the voter may cast his votes only for candidates of his own party. This means either that separate machines must be provided at each voting station for the different political parties participating in a primary election or that the machine must be so programmed or set up by an election official prior to the use of the machine by each voter that the voter cannot participate in the selection of candidates of parties other than his own. A similar problem arises in some elections where a voter may not be qualified to vote on certain issues as, for example, in the case of issues where only real property owners are eligible to participate. The use of separate voting machines in such special cases or in primary elections is, of course, expensive, and, particularly in regions where relatively small numbers of voters use a voting station, is not a practical solution to the problem. The programming of the machine for each voter is a laborious and time consuming operation and, hence, impedes the progress of the election. The present invention has for a principal object the provision of new and improved means for rendering a voting machine effective only for issues on which the voter is qualified to vote.

The invention has for another object the provision of a new and improved voter classification unit located at a position remote from the voting machine and accessible only to the precinct officials to avoid tampering or improper voting by the voter.

A further object of the invention is to provide a new and improved push button type remote voter classification unit which is electrically connected by a cable to the voting machine to render the latter machine effective to register votes only for issues upon which the voter is qualified to vote.

Another object of the invention is to provide a remote voter classification unit of the type described above operable by push buttons activated by the precinct officials which buttons are interlocked in a unique manner to prevent improper operation.

The invention has for another object the provision of a new and improved voter classification unit of the type described employing groups of switches respectively representing different voter classifications and so interlocked that only one of the switches can be operated.

The invention has for a further object the provision of a new and improved voter classification unit of the type described employing a first group of switches respectively representing different voter classifications so interlocked that only one switch of this group can be operated and also employing a second group of switches

any one or more of which may be operated with one of the switches of the first group.

Still another object of the invention is to provide a new and improved voter classification unit of the type described above employing a plurality of switches respectively representing different voter classifications and so interlocked that at least one of the switches must be actuated before the voting machine can be rendered effective.

A still further object of the invention is to provide a new and improved voter classification unit of the type described above employing a plurality of manually operated switches respectively representing different voter classifications which switches are locked to prevent changes in their positions from the start of each voting operation until its completion.

Yet another object of the invention is to provide a new and improved voter classification unit of the type described above employing a plurality of manually operated switches respectively representing different voter classifications and interlocked to permit operation of only one or a predetermined number of them but also employing means to release all of the switches to restore them to their original positions at any time prior to the start of the voting operation in order to permit the precinct official to reset the unit in the event that a mistake has been made.

The invention has for a still further object the provision of a new and improved electrical circuit for controlling the operation of a voting machine.

The foregoing and other objects are realized, in accordance with the present invention, by providing a voting machine of the type disclosed in the above-identified application Serial No. 120,281, now Patent No. 3,108,744, cooperating with a remotely positioned voter classification unit electrically connected to the voting machine via a cable. The remote unit is located outside of the voting booth and is accessible to the precinct officials but not to the voter and, as a result, the voter cannot tamper with the remote unit or use it in a fraudulent manner for improper voting. The remote voter classification unit includes a plurality of push buttons, one for each class of the voter, each controlling an electrical switch for completing different electrical circuits energizing groups of solenoids associated with counter actuators carried by a scanning rail as is described in the copending applications referred to above. The push button or buttons corresponding to each voter's classification is manually actuated by the precinct official prior to use of the machine by that voter and the voting machine itself has been pre-set or programmed to register the voter's selections only on issues corresponding to that classification. Since it is conceivable that a voter may fall into more than one classification for a particular election, it may be necessary for the precinct officials to activate more than one push button to set up the machine to permit voting on all of the issues for which the voter is qualified. For example, the election might be a primary election in which the voter is classified according to his political party affiliation in which case each push button of a first group represents a particular political party. The first group push buttons and the electrical switches controlled thereby are so interlocked that only one of them can be actuated. During the same election it is conceivable that additional issues could be presented which would require additional classification of the voter. For example, issues could be presented in which only a member of a given school district is eligible to vote and, at the same time, choices could be required upon issues in which only residents of a certain park district could participate. Thus, addi-

tional push buttons of a second group are provided for these additional issues. The push buttons of the latter group are operable independently of those of the first group and independently of each other so that any one of them or any group of them may be actuated. Each push button is mechanically locked in its actuated position after it has been operated but the interlock arrangement is such that a subsequent actuation of another button in the first group automatically releases any previously actuated button of that group. A manually operated RELEASE switch is provided for releasing all of the actuated buttons to restore them to their original positions at any time prior to the start of the voting operation, thus permitting the precinct officials to correct any mistakes which might have been made in actuating the remote unit. Following actuation of the proper push button or buttons corresponding to the voter's classification, START switch is actuated to initiate the voting procedure. An electrical interlock between the push button controlled switches and the START switch prohibits effective operation of the voting machine unless at least one of the push buttons has been operated and, hence, eliminates the possibility of the voter losing his vote altogether by failure of the precinct official to actuate any of the push buttons.

As is described in detail in the above-identified application Serial No. 120,281, now Patent No. 3,108,744, the voting machine includes a front panel made up of side by side columns each supporting one or more sliding keys or selectors movable to different positions to permit the voter to make his choices. A scanning mechanism is swept along the rear of the panel in one direction to sense the voter's selections and to actuate counters corresponding to the selected positions. The scanning mechanism is swept along the rear of the panel in the reverse direction to restore all of the keys to their neutral or non-voting positions. As the voter approaches the voting machine the scanning mechanism is at the bottom of the machine and the keys are in the selecting positions chosen by the preceding voter. A cover extends over the panel to prevent detection of the preceding voter's choices. When the START switch is actuated by the precinct official after the classification unit has been set to correspond to the voter's classification, the scanning mechanism starts its upward or key restoring sweep to raise the cover and restore all of the keys to their neutral or non-voting positions. The actuated push buttons of the classification unit supply information concerning the voter's classification and are electrically connected to the counter actuator solenoids of the different columns so as to render effective only those columns containing issues for which the voter is qualified. As is described in detail in the above-identified application Serial No. 120,281, now Patent No. 3,108,744, each column also has associated therewith a manually operated switch to permit that column to be rendered effective by any desired one of the push buttons. After the scanning rail completes its key restoring sweep, the voter proceeds to make his selections by moving the voting keys and when this operation has been completed he operates a VOTE switch to close a circuit to the drive motor for the scanning rail so that the latter begins to its vote sensing sweep. When the scanning rail completes its sensing sweep a circuit is completed to restore all of the push buttons to their original positions awaiting use by the precinct official for the next succeeding voter.

The invention both as to its organization and manner of operation 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 showing a voting machine electrically connected via a cable to a remote push button voter classification unit characterized by the features of the present invention;

FIG. 2 is an enlarged sectional view taken longitudinally through the remote classification unit along a line corresponding substantially to the line **2—2** in FIG. 1;

FIG. 3 is an enlarged, fragmentary sectional view taken along a line substantially corresponding to the line **3—3** in FIG. 1 and shows particularly the push button switches of the classification unit in their inoperative positions;

FIG. 4 is a fragmentary, sectional view taken along a line corresponding substantially to the line **4—4** in FIG. 3;

FIG. 5 is a fragmentary, sectional view taken along a line corresponding substantially to the line **5—5** in FIG. 4 and shows particularly the locking mechanism for holding the push button switches in their actuated position during the voting operation, this mechanism being illustrated in its inoperative condition;

FIG. 6 is a fragmentary, sectional view taken along a line corresponding substantially to the line **6—6** in FIG. 3 and shows particularly one of the push button switches;

FIG. 7 is a fragmentary, sectional view taken along a line corresponding substantially to the line **7—7** in FIG. 3;

FIG. 8 is a view similar to FIG. 3 shows several of the switches in their operated positions;

FIG. 9 is a view similar to FIG. 5 but shows the locking mechanism in its operative or effective condition;

FIG. 10 is a schematic diagram illustrating an electrical control circuit for the voting machine and the remote classification unit shown in FIG. 1, and

FIG. 11 is a chart showing the sequence of operation of the stepping switch used in the control circuit shown in FIG. 10.

Referring now to the drawings and first to FIG. 1, a voting machine generally indicated by the reference numeral **20** is there shown electrically connected by means of a cable **21** to a remote manually operated voter classification unit **22**. The voting machine **20**, as was indicated above, is preferably of the type described and claimed in the above-identified application Serial No. 120,281, now Patent No. 3,108,744, and, as is described in the latter application it includes a front panel indicated generally by the reference numeral **23** and made up of a number of side by side columns each containing one or more voting keys or selectors **24** mounted for sliding movement vertically of the panel to permit the voter to make his selections. The machine **20** is further provided with a scanning mechanism (not shown) which is moved in one direction along the rear of the panel **23**, as viewed in FIG. 1 to sense the voter's selections and to actuate counters corresponding to the positions of the candidates or issues chosen by the voter. The remote unit **22** contains a number of push button actuated switches **25–1**, **25–2**, **25–3**, etc., respectively corresponding to different voter classifications. These switches are manually operated by the precinct officials prior to use by each voter in order to render the voting machine **20** effective only for issues upon which that voter is qualified to cast his votes. Since the unit **22** is remote from the voting booth containing the machine **20**, the voter is unable to tamper with the remote classification unit or to use fraudulent practices for improper voting. The push button switches are mounted upon a generally rectangular housing **26** formed by a base plate **33** (FIG. 2) joined to an upper cover **27** having end walls **28** and **29**, side walls **30** and **31** and a top wall **32**. The base plate **33** is secured to the upper cover by means of a pair of angle pieces **34** only one of which is visible in FIG. 2. These angle pieces extend along opposed side edges of the base plate and each has one leg secured to the base plate by means of removable machine screws to permit removal of the base plate. Each of the removable screws also holds a rubber foot **36** against the bottom of the base plate. The other legs of the angle pieces **34** are riveted or otherwise secured to the side walls **30**

and 31, respectively. The rubber feet 36 permit the remote unit 22 to be placed upon a desk or finished piece of furniture without scarring the surface. The end wall 28 of the cover is suitably notched as indicated at 37 to receive a grommet 38 encircling the cable 21. A cable holder (not shown) is affixed to the top of the base plate 33 in any suitable manner in order to hold the end of the cable 21 in position. Certain of the conductors of the cable 21 are connected to a socket (not shown) mounted upon the base plate while other conductors of the cable are connected to a switch unit indicated generally by the reference numeral 41. As is best shown in FIGS. 2 and 3, the latter unit is supported in elevated position above the base plate 33 upon a pair of spaced apart vertical posts 42 and 43 which are secured to the base plate in any suitable manner, as for example, by machine screws.

Considering next the switch unit 41 and referring particularly to FIGS. 2 and 3 of the drawings, it will be observed that this unit comprises a rigid frame 44 supporting the push button actuated switches 25–1, 25–2, 25–3, etc., and secured to the upper ends of the posts 42 and 43. The frame 44 is formed by a pair of horizontal upper and lower channels 45 and 46 joined at their ends by a pair of vertical end channels 47 and 48. A pair of bars 39 and 40 and a pair of center reinforcing bars 17 and 19 extend between the channels 45 and 46 and are respectively disposed near the end channels 47 and 48. As is shown in FIGS. 4 and 6 a pair of side plates 49 and 50 extend between the end channels 47 and 48 on opposite sides of the frame 44 and adjacent the lower channel 46. The side plates are detachably secured to the end channels 47 and 48 in any suitable manner as, for example, by removable machine screws, and to add rigidity, they are further supported by a brace 18 secured to the center reinforcing bar 19 (FIG. 4). Each side plate supports a plurality of conventional, normally open sets of contacts there being one such contact on each side plate for each of the switches 25–1, 25–2, 25–3, 25–4, 25–5 and 25–6. The two normally open sets of contacts associated with the push button switch 25–1 have been identified by the reference numerals 25–1*a* and 25–1*b* and these two contact sets are respectively attached to the side plates 49 and 50. Similarly, the two sets of contacts associated with the push button switch 25–2 have been identified by the reference numerals 25–2*a* and 25–2*b* and so on for the remaining switches. The frame 44 also supports a manually operated START switch 51 (FIGS. 2 and 3) the purpose of which will become apparent as the description proceeds. As is shown in FIGS. 4 and 5, the side plate 49 supports a set of normally open contacts 52 associated with the START switch while the side plate 50 supports a commonly mounted set of normally open contacts 53 and normally closed contacts 54 both of which are operated by the START switch. As is shown in FIG. 7, the contacts 52, 53 and 54 are supported in conventional manner upon a base formed of a plurality of insulating layers sandwiched around contact arms extending vertically upward from the base. As is shown in FIG. 6, each of the remaining sets of contacts 25–1*a*, 25–1*b*, etc., supported on the plates 49 and 50 also comprises a conventional base structure formed by layers of insulating material surrounding contact arms which extend upwardly. One arm of each contact set is adapted to be deflected outwardly when the associated push button switch is actuated. The push button switches 25–1, 25–2, 25–3, 25–4, 25–5 and 25–6 and the START switch 51 are very similar in construction and, hence, only one of them will be described in detail. For example, as is shown in FIG. 6, the push button switch 25–1 includes a vertically extending switch arm 59 having an enlarged central body portion 59*a* formed integral with an upper leg 55 extending upwardly through a guide slot 56 formed in the upper channel bar 45. A lower integral leg 57 extends downwardly from the body portion 59*a* through a slot 58 formed in the lower channel bar 46. The slots 56 and 58 are vertically alined to guide the movement of the switch arm 59. A suitable push button 60 is secured to the extreme upper end of the upper leg 55 and this push button extends through an aperture 32*a* formed in the top wall of the housing cover member 27. One such aperture is provided for each of the push button switches 25–1, 25–2, 25–3, 25–4, 25–5 and 25–6 and on an additional aperture 32*b* (FIG. 3) is provided for the START switch 51. The series of apertures 32*a* and the aperture 32*b* are alined in a direction extending longitudinally of the housing 26. The enlarged central body 59*a* of the switch arm also has a pair of laterally depending arms 61 and 62 each carrying a pair of rollers 63 and 64 (FIG. 3). The two rollers of each pair are alined and each is mounted upon a pin extending outwardly from one of the depending arms 61 or 62. One of the rollers of each pair engages the movable or deflectable arm of one of the sets of contacts mounted on the side plates 49 and 50. Thus, when the switch arm 59 is moved downwardly by manually depressing the push button 60 the roller 64 moves along the deflectable arm of the contact until it engages the bent or inclined portion 64*a* thereon whereupon the movable contact arm is flexed outwardly to close the normally open contacts. As will be apparent from the above description the downward movement of each switch arm 59 is effective to close two sets of contacts one set being mounted on the side plate 49 and the other set being mounted on the side plate 50. However, as is described more fully hereinafter, the depression of the switches 25–1, etc., in and of itself, does not produce any immediate results since the depressed switches become effective to perform a useful function only when the START switch 51 is actuated after all of the switches 25–1, etc., have been properly set. To accomplish these results, means are provided for locking each of the push button switches 25–1, 25–2, 25–3, etc., in its actuated position after it has been depressed. Under certain election conditions, for example, in a primary election where a voter is permitted to make choices only between candidates of his political party, it is desirable to interlock a first group of push button switches, for example, the switches 25–1, 25–2, 25–3 and 25–4 so that only the one corresponding to the party of the voter using the machine can be actuated. To satisfy other election conditions which may arise it is desirable to permit operation of a second group of push button switches, for example, the switches 25–5 and 25–6 independently of each other and either simultaneously with one of the switches in the first group or independently of the latter switches. To permit the precinct official to change the switches of the first group in case a mistake has been made, the interlocking means is preferably so constucted that operation of any switch in this group causes any previously actuated switch to be automatically restored to its original or inoperative position. The described interlocking means comprises a pair of sliding bars 65 and 66 mounted for horizontal sliding movement on the frame 44 and having their inner ends in abutting end to end relationship as is shown in FIGS. 3 and 8. The bar 66 extends through an elongated opening 59*b* in the central body portion 59*a* of each of the switch arms 59 of the push button switches 25–1, 25–2, 25–3 and 25–4 of the first group and has its outer end extending through alined openings 47*b* and 39*a* respectively formed in the end channel 47 and the reinforcing bar 39. A wire spring 67 mounted at one end on the channel 47 has its free end engaging the outer end of the bar 65 to urge both of the bars 65 and 66 toward the right as viewed in FIG. 3. The ends of the spring 67 are inserted through openings 47*a* in the channel 47 and the spring is bent to provide the desired spring force. The sliding movement of the bar 65 is guided by an elongated opening 68 provided near the outer end and cooperating with a guide roller 69 which is supported upon a pin 70 carried by the end channel 47. To limit the lateral movement of the sliding bar 65 the slot or opening

39*a* in the reinforcing bar 39 is relatively narrow near its upper and lower ends. The bar 65 is notched along its bottom as indicated as 73 (FIG. 3) to cooperate with an adjustable plate 74 mounted on the channel 47 to limit the longitudinal movement of the bar.

To control the movement of the sliding bar 65 when one of the keys 25–1, 25–2, 25–3 or 25–4 is depressed, the bar is provided with a plurality of cam defining openings 75, 76, 77 and 78, one for each of the push button switches 25–1, 25–2, 25–3 and 25–4 of the first group. The four cam defining openings are identical and, as is indicated for the opening 75 in FIG. 3, each comprises an upper enlarged portion indicated at 75*a* and a lower enlarged portion 75*b* interconnected by a channel 75*c*. The left hand side of the opening 75 as viewed in FIG. 3 forms a cam surface for controlling the movement of the sliding bar 65 as the push button switch 25–1 is depressed. This cam surface is engaged by a follower pin 79 supported upon the ends of a pair of cantilevered spring arms 80 and 81 (FIG. 6) mounted on the switch arm 59. When the push button switch is in the neutral or inoperative position shown in FIG. 3 the follower 79 is disposed in the upper portion 75*a* of the cam defining slot in engagement with an inclined face 82 but when the switch is depressed the follower rides along the face 82 thereby to move the sliding bar 65 to the left. The cam further includes a reversely inclined surface at one side of the guide channel 75*c* to provide a snap-over action as the follower 79 passes over the apex 82*a* formed at the junction between the faces 82 and 83. The left hand side of the lower portion 75*b* serves as a retainer to hold the follower 79 and the push button switch in the depressed position after it has been actuated. A coil spring 85 encircles the lower leg 57 on each switch arm and is interposed between the enlarged body portion 59*a* and the lower channel bar 46 to urge each of the push button switches towards its neutral or inoperative position as shown in FIG. 3. The upward movement of each switch is limited by a collar 35 and cushion 35*a* seated on a shoulder formed by the body portion 59*a*. The cushion 35*a* (FIG. 6) is urged against the upper channel 45 by the spring 85 when the switch is in the inoperative position. When any one of the switches 25–1, 25–2, 25–3, or 25–4 of the first group, for example, the switch 25–2, is depressed its associated coil spring 85 is compressed and the follower 79 rides along the inclined surface 82 to force the sliding bar 65 toward the left as viewed in FIG. 3 against the action of the spring 67. The sliding bar thus moves from the position shown in solid lines in FIG. 8 to that shown in broken lines and the arm of the spring 67 is also deflected from the solid line to the broken line position. Continued downward movement of the push button switch forces the follower 79 along the guide channel 75*c* and moves the roller 64 along the deflectable arms of the contacts 25–2*a* and 25–2*b* to close the two sets of normally open contacts. As the follower 79 moves along the reversely inclined surface 83 the sliding bar 65 is moved slightly to the right as viewed in FIG. 3 by the spring 67 so that the reversely inclined surface 83 applies a force on the follower 79 tending to prevent the switch from returning to the neutral or inoperative position. When the follower 79 reaches the bottom of the reversely inclined cam surface 83 and moves into the lower retaining portion 75*b* the spring 67 is effective to move the sliding bar 65 further to the right so that the lower retainer surface 84 overlies the follower and locks the switch 25–2 in the depressed or operative position shown in FIG. 8.

As was indicated above, the sliding bar 65 is so constructed and arranged that subsequent depression of one of the switches of the first group with one of the switches of that group already in the operative position causes the previously operated switch to return to the neutral or inoperative position shown in FIG. 3. Thus, assuming that the push button switch 25–2 is in the operative position shown in FIG. 8 and is being held by the coaction between the lower retaining surface 84 and the follower 79 and assuming, further, that a second switch of the first group, for example, the switch 25–1 is subsequently depressed, it will be observed that the follower 79 of the second switch 25–1 first rides along the inclined cam surface 82 to move the sliding bar 65 to the left against the action of the spring 67. As the follower 79 of the switch 25–1 reaches a position near the apex 82*a* the sliding bar 65 has moved to the broken line position shown in FIG. 8 whereupon the follower 79 of the switch 25–2 may enter the guide channel 75*c* and the coil spring 85 associated with the spring 25–2 may now expand to raise the switch arm 59 of the switch 25–2 thus returning the switch 25–2 to its neutral or inoperative position shown in FIG. 3. Further downward movement of the switch 25–1, of course, causes the spring 67 to return the sliding bar 65 to the right in order to lock the switch 25–1 in its operative position. In view of the foregoing description it will be recognized that only the last actuated switch of the first group is locked in the operative position by the sliding bar 65.

Means are also provided for preventing simultaneous operation of more than one of the switches of the first group, thereby preventing the precinct official from rendering the voting machine effective for more than one classification in this group. The latter means comprises a generally U-shaped trough 86 extending along the bottom of the frame 44 beneath the lower channel bar 46 and having at its opposed ends L-shaped brackets 87 and 88 which are respectively secured to the under sides of the end channels 47 and 48. The trough 86 carries a plurality of relatively hard balls 89 which are disposed side by side and extend along the bottom of the frame beneath the four switches of the first group. These balls are retained in the trough at one end by the L-shaped bracket 87 and at the other end by a plug 90 suitably secured within the trough. The space between the plug and the bracket 87 is such that the balls 89 fit loosely within the trough but there is sufficient space to permit the entry of only one of the lower legs 57 of the switches 25–1, 25–2, 25–3, or 25–4. Thus, when one of the switches is depressed, for example, the switch 25–2 shown in FIG. 8, the extreme lower end of the portion 57 engages the balls and the space provided is such that this extreme lower portion can enter the trough. If an attempt is made to actuate two of the switches of the first group simultaneously, the balls 89 prevent entry of more than one of these switches into the trough 86 and, for this reason, only one of the switches can be moved to the operative or lowermost position.

As was indicated previously the switches 25–5 and 25–6 of the second group are adapted to be actuated independently of the four switches of the first group and independently of each other so that either one of these switches or both of them may be placed in the operative position. This is an important feature in permitting the voting machine to be set up to handle a number of different conditions which may arise during a particular election. For example, let it be assumed that the election to be conducted is a primary election and that the switches 25–1, 25–2, 25–3 and 25–4 of the first group respectively represent the different political parties to which the voters may belong. Thus, the push button switch 25–1 may represent the Democrat party, the switch 25–2 may represent the Republican party, the switch 25–3 may represent the Socialist Labor party and the switch 25–4 may represent an Independent party. Of course, these designations are only illustrative since any one of the switches may represent any desired one of the political parties and the designations may be changed for different elections or even for different machines used in the same election. As is shown in FIG. 1, the parties represented by the various switches are indicated by a card or plate 91 which is inserted into a suitable card holder 92 affixed to the top of the wall 32 and located in a position ad-

jacent the apertures **32***a*. The card holder comprises a generally rectangular frame having a plurality of elongated side by side slots **92***a* therein with each slot being alined with one of the apertures **32***a*. The card contains indicia visible through the slots **92***a* to identify the particular push button alined with that slot. The frame is open at one end as indicated at **93** to permit insertion of the card **91** and, if desired, a plastic overlay plate may be inserted to protect the card. The party affiliation of the voter using the machine is first identified either by the voter orally informing the precinct officials as to his party preference or by reference to precinct records. The precinct official then presses the particular button of the first group **25–1**, **25–2**, **25–3** or **25–4** corresponding to that party affiliation. However, there may be other issues presented during the primary election which have nothing whatsoever to do with party affiliation. For example, let it be assumed that there is an issue involving a school bond proposal in which all voters residing within a particular school district are eligible to vote regardless of their political party affiliation. In such case, the school bond residence classification may be represented by the push button **25–5**. During the same election it is conceivable that there could be a further issue such as a park district bond proposal in which only residents of a particular park district are eligible to participate regardless of their political affiliation and irrespective of whether they live in the school district represented by the push button switch **25–5**. The park district residence classification may, therefore, be represented by the push button **25–6**. Thus, it is conceivable that a single voter may be a resident of the park district, a resident of the school district and a member of one of the political parties represented by the push button switches **25–1**, **25–2**, **25–3** and **25–4** in which case it will be necessary to actuate three different push buttons to set up the voting machine **20** to permit the voter to pass upon all of the issues for which he is qualified. Thus, as is shown in FIG. 8 the precinct official will depress both of the push button switches **25–5** and **25–6** and one of the push button switches of the first group so that all three of these switches will be operated and held in the operative position. It is, of course, possible that only one of the switches of the second group **25–5** or **25–6** need be operated for another voter who desires to use the machine and in this case the desired switch may be operated at the same time as one of the push button switches of the first group. It is also conceivable that the voter may not wish to participate in the primary election or may not be eligible to do so with the result that none of the switches of the first group will be actuated. The desired results are achieved, in accordance with the present invention, by the second sliding bar **66** which cooperates with the push button switches **25–5** and **25–6** and with the START switch **51** to hold the latter three switches in the operative position when any one of them is depressed. To this end, the sliding bar **66** is provided with three cam slots **94**, **95** and **96** respectively associated with the switches **25–5**, **25–6** and the START switch **51**. These three slots are identical to each other and are shaped like the cam slots **75**, **76**, **77** and **78** but face in the opposite direction from the latter slots. Each of the slots **94**, **95** and **96** comprises an upper enlarged rest portion **94***a*, a lower locking portion **94***b* and a slot **94***c* interconnecting the portions **94***a* and **94***b*. The left hand side of each cam slot **94**, **95** and **96** as viewed in by a follower **97** carried on the associated switch **25–5**, FIGS. 3 and 8 forms a cam surface **98** which is engaged **25–6** or **51**. The latter three switches are similar in construction to each other and also to the switches **25–1**, **25–2**, **25–3** and **25–4** described above except that the followers **97** of the switches **25–5**, **25–6** and **25–7** are mounted on the opposite side of the switch arm **59** from the followers **79** on the switches **25–1**, **25–2**, **25–3** and **25–4**. The spring arms **80** and **81** are deflectable about their fixed ends on the switch arm to permit the followers **97** to move slightly outward from the body portion as the follower moves along the cam surface **98**. Thus, as one of the switches of the second group, for example, the switch **25–5** is depressed its follower **97** first rides along an inclined cam surface **101** forming one side of the channel **94***c*. The spring **67** acting through the bar **65** and against the end of the bar **66** is stronger than the spring arms **80** and **81** supporting the follower and, hence, prevents movement of the sliding bar **66** towards the left as the switch **25–5** is depressed. Thus, the inclined surface **101** acts against the follower **97** to move the latter outwardly from the enlarged central body portion **59***a* by pivoting the spring arms **80** and **81** in a counterclockwise direction as viewed in FIGS. 3 and 8. When the follower **97** reaches the lower locking portion **94***b* the spring arms **80** and **81** move the follower back against the enlarged central body portion **59***a* but underlying the surface **102** at the top of the locking portion **94***b*, thus holding the switch **25–5** in the operative position. The same action occurs when the switch **25–6** is depressed since its follower **97** is first moved outwardly by the inclined cam surface **101** and is then returned to lock the switch in the operative position. Since the sliding bar **66** does not move during depression of the switches **25–5** or **25–6** either or both of them may be actuated. Moreover, since there are no balls in the area of the trough **86** lying beneath the switches **25–5** and **25–6** it is possible to actuate both of them simultaneously.

The START switch **51** as was indicated above, is constructed identically with the switches **25–5** and **25–6** except that it has a push button **103** attached to its upper end which button is somewhat taller than the push buttons **60** on the switches **25–5** and **25–6**. The push button **103** extends through the opening **32***b* and through an annular collar or protector **104** which is affixed to the top wall **32** around the opening **32***b*. The protector **104** prevents inadvertent actuation of the START switch until the push button switches have been actuated to correspond with the voter's classification.

The START switch **51** has associated therewith means for locking all of the depressed push button switches **25–1**, etc. in their operative positions when the switch **51** is depressed. This locking means is best shown in FIGS. 5 and 9 and comprises an elongated latch bar **105** mounted for sliding movement in the end channels **47** and **48** and extending through guide slots **47***c* and **48***c* formed in these two channels. A cantilevered leaf spring **106** secured at one end to the side plate **50** and having its free end extending outwardly to engage the extreme outer end of the latch bar **105** normally urges this bar toward the right as viewed in FIGS. 5 and 9. When the START switch **51** is depressed a shoulder **107** (FIG. 7) thereon engages an inclined cam face **108** (FIG. 5) formed by an open ended slot **109** in the latch bar **105** thus moving the sliding bar against the action of the leaf spring **106** toward the left as viewed in FIG. 9 from the position shown in solid lines to that shown in broken lines. When the follower **97** on the switch **51** is seated within the locking portion **94***b* to lock the START switch in its operative position the latch bar **105** is held in its extreme right position by the shoulder **107** and the cam face **108**. The latch bar **105** is provided with six open ended slots **110** each associated with one of the switch arms **25–1**, **25–2**, **25–3**, **25–4**, **25–5** and **25–6**. A finger **111** extends inwardly adjacent the open end of each of slots **110** so that, when the bar **105** is moved to the left, the fingers engage and lock all of the switches **25–1**, etc. which have been depressed. More specifically, when each of the switches **25–1**, etc. is moved to its operative position the central body portion **59***a* of that switch moves from the position shown in FIG. 5 to that shown in FIG. 9 for the switches **25–2**, **25–5** and **25–6**. When the switch is in the operative position, its central body portion **59***a* enters the associated slot **110** until a rectangular opening **112** in the body por-

tion 59*a* is alined with the finger 111 of that slot. Subsequent movement of the latch bar 105 to the left by cooperation between the shoulder 107 and the cam face 108 when the START switch 51 is depressed causes a finger 111 to enter the opening 112 of each operated switch, thus locking all of the operated switches in their actuated positions. The locking bar 105 remains in the locking position shown in FIG. 9 throughout the voting procedure to prevent further change in the switch positions while the voter is using the voting machine 20. At the same time the finger 111 associated with each inoperative switch extends beneath the enlarged central body portion 59*a* of that switch to prevent subsequent actuation of any of these push button switches while the voting procedure is taking place.

Means are also provided for releasing all of the operated switches including the START switch 51 automatically at the completion of the voting operation. As is shown in FIGS. 2, 3 and 4, this means comprises a solenoid 114 mounted upon a bracket 115 secured to the end channel 48 and having an armature 116 acting upon the right end of the sliding bar 66 as viewed in FIG. 4. When the solenoid 114 is energized in a manner described more fully hereinafter the armature 116 is moved toward the left thus moving both of the sliding bars 65 and 66 in unison to the left against the action of the spring 67. When the bars reach the position where the followers 79 and 97 are free to move upwardly through the channels of their cam slots all of the operated push button switches are returned to their neutral or inoperative positions shown in FIG. 3 by expansion of the coil springs 85. The sliding movement of the bar 66 is guided by a roller 117 which is similar to the roller 69 described above and which seats within an elongated slot 118 in the bar 66. The roller 117 is supported upon a pin 119 carried by the end channel 48.

It is also desirable to permit the precinct officials to release the operated push button switches at any time before the voting operation actually begins so that these officials will be able to correct any mistakes in setting up the machine. To this end, there is provided a push button release switch 120 (FIG. 1) which is suitably mounted upon the top wall 32 of the housing cover 27 and is electrically connected to the socket referred to above but not shown in the drawings. This socket is also connected through conductors to an indicating light 122 (FIG. 2) visible through a refractor 123 mounted on the top wall 32 to indicate that power has been supplied from the main voting machine 20 to the remote unit 22. When the release button switch 120 is depressed a circuit to be described more fully hereinafter is completed to the solenoid 114 which is actuated to drive the armature 116 to the left as viewed in FIG. 4, thus moving both of the sliding bars 65 and 66 to the release positions and permitting all of the operated switches 25–1, 25–2, etc., to return to their neutral or inoperative positions. The precinct official may then proceed to set up the remote unit 22 in the proper manner by depressing the desired push button switches 25–1, etc., corresponding to the correct voter classification.

Turning now to the operation of the voting machine 20 and the remote unit 22 it should first be observed that when the voter first approaches the voting machine, the scanning mechanism is at the bottom of the voting machine housing and a curtain (not shown in FIG. 1 but described in the copending applications identified above) covers the front panel 23 so that the selections made by the previous voter are not visible. After the precinct officials have pressed the proper button or buttons 25–1, 25–2, 25–3, etc., corresponding to the voter's classification, the START switch 51 is then operated by these officials to complete a circuit for raising the scanning mechanism in order to restore all of the voting keys to their neutral positions and to raise the curtain in order to uncover the front panel 23.

The electrical circuit for controlling the operation of the voting machine is illustrated schematically in FIG. 10 and comprises a conventional plug 125 for connection to a suitable A.C. source. Two line conductors 126 and 127 lead from the plug 125 through a power ON-OFF switch 128 on the main voting machine 20 and through fuses 129 and 130. The line 126 is connected through a conductor 131 of the cable 21 to the light 122 and to one side of the solenoid 114. The line 127 is connected via another conductor 132 of the cable 21 and through the normally closed contacts 54 to the other side of the light 122, thus energizing the latter to show that power has been applied to the remote unit 22 whenever the power ON-OFF switch 128 is closed. Another indicating light 133 on the main voting machine 20 is connected in series with a current limiting resistor 134 across the line conductors to indicate the application of power to the main machine whenever the switch 128 is closed.

The scanning rail (not shown but the drive motor for which is represented by windings 135 and 136) is effective to engage and operate a micro switch 137 once during each cycle. This switch may be engaged either when the rail is at the top of the panel 23 or when it is at the bottom. The purpose of the switch is to control a counter actuating sub-circuit 138 which includes a half wave rectifier 139, a condenser 140, a pair of resistors 141 and 146, and two parallel connected counter actuating solenoids 143 and 144 for a pair of conventional Veeder Root counters. One of these counters is adapted to count the number of cycles of the scanning rail and, hence, the number of votes cast during each election. This counter is set to zero at the start of the election. The other counter is adapted to count the total number of cycles of the scanning rail to which the machine is subjected during all elections, thereby to provide some indication as to when routine maintenance should be performed. The setting of the latter counter is obviously not disturbed between elections. When the switch 137 is closed by the rail a circuit is completed to energize both of the solenoids 143 and 144 in order to advance both counters one step. The condenser 140 is charged by the rectified current from the diode 139 and discharges through the solenoids to provide sufficient current for operating the counters.

The sequence of operation of the voting machine is controlled primarily by a commercially available stepping switch 145 sold by C. P. Clare and Co. of Chicago, Illinois, and identified as their type 200 stepping switch. This switch has five cam sections a first of which controls a single set of contacts 145*a*, a second of which controls two sets of contacts 145*b* and 145*b'*, a third of which controls a set of contacts 145*c*, a fourth of which controls a set of contacts 145*d*, and a fifth of which controls a set of contacts 145*e*. A complete cycle of the stepping switch involves nine steps as indicated by the chart shown in FIG. 11 where the numbers in the extreme left column represent the five cam sections and the numbers along the top row represent the nine step positions. Each step requires about one twentieth of a second. With the stepping switch in its home or original position all of the sets of contacts 145*a*, 145*b*, 145*b'*, 145*c*, 145*d* and 145*e* are in the position shown in FIG. 10 and the position there shown for each contact set will be referred to as the A position for simplicity. When the cam moves the contacts to the position opposite to that shown in FIG. 10 this will be called the B position.

The stepping switch 145 is advanced through its cycle by an operating coil 147 which is supplied with current from a conventional bridge rectifier 148. A diode 149 with opposite polarity to that of the bridge rectifier is connected in parallel with the coil 147. This diode short circuits the voltage spike generated by the collapsing field in the coil at the end of an advance cycle. One input terminal 148*a* of the bridge rectifier is connected via a conductor 150 to one line 126 of the A.C. source while a second input terminal 148*b* is connected via a conductor

151 of the cable 21 to the remote unit. An electrical interlock is provided to prevent the conductor 151 from being connected to the second line 127 of the source unless at least one of the push button switches 25–1, 25–2, 25–3, 25–4, 25–5 and 25–6 has been operated. This interlock comprises a bridging conductor 152 interconnecting one contact of each of the sets 25–1*b*, 25–2*b*, 25–3*b*, 25–4*b*, 25–5*b* and 25–6*b*. A second bridging conductor 153 interconnects the other contact of each of the latter sets of contacts and this bridging conductor is connected to one of the contacts of the set 52 so that when the START switch 51 is depressed the contact set 52 connects the bridging conductor 153 to another cable conductor 154 which leads to a party vote control indicated generally by the reference numeral 155 but not shown in detail. The party vote control may be of the general type disclosed in U.S. Patent No. 3,092,311, assigned to the same assignee as the present application. The conductor 154 is connected to another conductor 156 by means of a closed switch located within the party vote control 155 but not shown in detail. With the stepping switch 145 in the home position as it is at the start of the voting operation when the voter approaches the machine 20, the conductors 154 and 156 are thus connected through contacts 145*a* and 145*c* to the line conductor 127, thus completing an electrical circuit to the bridge 148 and the operating coil 147 of the stepping switch as soon as the START switch 51 is depressed by the precinct official. If none of the switches 25–1, 25–2, 25–3, 25–4, 25–5 or 25–6 is operated, the conductor 151 is not connected to the conductor 153 and, hence, the coil 147 cannot be energized. Following the energization the stepping switch self steps through the second, third and fourth positions which positions may be termed the arm cycle. In these three positions, contacts 145*a*, 145*b* and 145*b'* are moved by their cams to the B positions while contacts 145*c*, 145*d* and 145*e* remain in their A positions. Contacts 145*a* supply current to the bridge rectifier 148 from line conductor 127 through contacts 145*c*. When the stepping switch advances to its fifth position contacts 145*c* are moved to their B position while contacts 145*a*, 145*b* and 145*b'* revert to their A positions. Contacts 145*c* thus break the energizing circuit to the bridge rectifier 148 and coil 147 even though the START switch 51 remains in the closed or depressed position. When contacts 145*c* reach the B position, a circuit is completed from line conductor 127 to the motor winding 135 through contacts 145*d* and through section 157*a* of an upper limit switch 157 which is mounted in fixed position on the voting machine 20 near the top of the panel 23 but behind the panel. With the motor winding 135 energized the scanning rail is driven upwardly in its key restoring sweep to raise the curtain from the front panel 23 and to return all of the selectors 24 to their neutral or non-voting positions as is described in detail in U.S. Patent No. 3,095,142 assigned to the same assignee as the present invention. When the scanning rail reaches its uppermost position it strikes the limit switch 157 to move the switch contacts 157*a* to the position where the drive to the motor is interrupted. In this position, the switch section 157*a* supplies power for a lamp 166 which is located near the top of the voting machine 20 to illuminate the front panel 23. The switch section 157*a* also completes a circuit to an isolation transformer 165 which supplies power to a set of column indicating lights 159–1, 159–2, etc., described more fully hereinafter. The stepping switch remains in its fifth position while the scanning rail is raising. A second set of switch contacts 157*b* of the upper limit switch completes an enabling circuit to the motor winding 136 when the upper limit switch is engaged.

As is described in detail in the copending application of Edward J. Crossland et al Serial No. 120,281, now Patent No. 3,108,744, referred to above, each of the columns of the voting machine 20 has associated therewith a counter actuator which is adapted to be moved to the counter actuating position only when a solenoid associated with that column is energized. The solenoids for the different columns are identified in FIG. 10 by the reference numerals 158–1, 158–2, 158–3, etc. Actually, the voting mahine contains twelve columns but, for purposes of illustration, only three solenoids are represented in FIG. 10. As was indicated above, each column of the voting machine also has associated therewith an indicating light, the light for the first column being identified in FIG. 10 by the reference numeral 159–1, the light for the second column being identified by the reference numeral 159–2 and so forth. The illumination of the indicating lights 159–1, 159–2, etc., is visible from the front panel of the voting machine since each of these lights is disposed behind a light cover located at the top of the associated column. The illumination of the lights 159–1, 159–2, etc., indicates which columns are active and, hence, informs the voter as to those columns in which his selections should be made. A current limiting resistor is connected in series with each indicating light and these resistors are designated by the reference numerals 160–1, 160–2, etc. The lights and resistors are connected via a conductor 164 to the secondary of the isolation transformer 165 which has its primary winding connected across the A.C. line through the overhead lamp 166. Also connected in series with each light is a switch which is adapted to be closed by the counter actuator of its associated column only if that actuator has been moved to its counter actuating position by the column solenoid. The latter switches are indicated in FIG. 10 by the reference numerals 161–1, 161–2, 161–3, etc., and are located in fixed position near the top of the panel 23. If the counter actuator has been moved to its actuating position by energizing its associated solenoid 158–1, 158–2, etc., the switch 161–1, 161–2, etc., associated therewith will be closed and the indicating lights 159–1, 159–2, etc., will be illuminated to inform the voter as to which columns can be voted. If the voter notices that certain columns containing issues within his qualifications have not been activated he will call the precinct official who will be able to determine whether a mistake has been made in setting up the machine 20 or the remote unit 22 or whether there has been a malfunction in the machine requiring repair.

For the purpose of permitting the election officials to program the machine prior to the election, there is associated with each column a multiple position, manually operated selector switch, the switch for the first column being indicated by the reference numeral 162–1, that associated with the second column being identified by the reference numeral 162–2, and so on. The switches are located within the housing for the voting machine and are not accessible to the voter or to the precinct officials during the course of the election. The switches are set by a custodian or other election official prior to the election and the housing is locked throughout the course of the election to prevent tampering with the switches. The switches 162–1, 162–2, etc., are adapted to be preset by the custodian to cooperate with the solenoids 158–1, 158–2, etc., to render effective only those columns of the voting machine containing issues upon which the voter is qualified to vote as indicated by the operated push button switches 25–1, etc. To this end, each selector switch contains a number of switch positions corresponding to the number of different voter classifications. For purposes of illustration, a six position switch is shown in FIG. 10 so that the voting machine is capable of handling four different classifications of voters within a first group corresponding to the first group of push button switches 25–1, 25–2, 25–3 and 25–4 and two classifications of a second group corresponding to the push button switches 25–5 and 25–6. For example, the first four switch positions may represent Democrat, Republican, Socialist Labor and Independent, in the primary election

assumed above, the fifth switch position may represent the school district classification and the sixth position may represent the park district classification. Each of the selector switches contains a movable wiper arm, and a set of fixed contacts equal in number to the number of different voter classifications, for example, six fixed contacts in the illustration assumed above. The movable wiper arm of each switch is connected to the associated solenoid **158–1**, **158–2**, etc., while each fixed contact is connected via a conductor of the cable **21** to one contact of its associated set **25–1***a*, **25–2***a*, **25–3***a*, **25–4***a*, **25–5***a* or **25–6***a*. The other contacts of each of the latter sets are joined together by a connector **167** which leads through the conductor **132** to one side of the A.C. line. The solenoids of the first six columns are interconnected by a conductor **168** connected to the movable arm of the contact set **145***b* while the solenoids of the last six columns are interconnected by a conductor **169** leading to the movable arm of the contact set **145***b'*.

To understand the operation of the electrical circuit illustrated in FIG. 10, let it be assumed that it is desired to program the machine **20** for operation in a primary election so that all of the issues upon which the Democrat voter is eligible to vote are located in the first column, namely, in the column associated with the solenoid **158–1** whereas all of the issues upon which the Republican voter is eligible are located in the column associated with the solenoid **158–2**, and so on. It should be understood, however, that the switches **162–1**, etc., and the push button switches **25–1**, etc., may be coordinated to permit any desired column or columns to be used for any particular class of voter. In the example assumed, however, the switch **162–1** associated with the Democrat column is set to the first position as illustrated in FIG. 10 while the switch **162–2** is set to the second position and the switch **162–3** is set to the fifth position. The first contact of all of the switches is connected via a conductor **171** of the cable **21** to one contact of the set **25–1***a* while the second contact of all switches is connected to one contact of the set **25–2***a* via a conductor **172** and the third contact of all switches is connected via a conductor **173** to one contact of the set **25–3***a*. Conductors **174**, **175** and **176** connect the fourth, fifth and sixth switch contacts to the contact sets **25–4***a*, **25–5***a* and **25–6***a*, respectively. When the push button **25–1** is depressed all of the columns in which the switch **162–1**, **162–2**, etc., is in the first position are connected to the line **127**. Similarly, the line **127** is connected to all columns having their switches in the second position when the push button switch **25–2** is depressed and so on for the other four push button switches. When the START switch **51** is depressed and the stepping switch begins its cycle, the contacts **145***b* and **145***b'* are moved to their B positions to connect all of the solenoids **158–1**, **158–2**, etc., to the line **126**, thus completing a circuit to energize all solenoids having their switch positions corresponding to an operated push button switch **25–1**, etc. The energized solenoids move their counter actuators to a counter actuating position in the manner described in the above-identified copending application Serial No. 120,281. Thus, it will be observed that the voting machine may be easily programmed or set up by manipulation of the switches **162–1**, **162–2**, etc., to permit the voter to make selections only in those columns of the voting machine containing issues corresponding to his classification of the switches **162–1**, **162–2**, etc., to permit the voter **25–1**, **25–2**, etc.

After the scanning mechanism and the curtain have been raised, the voter proceeds to make his selections on the front panel **23** by manipulating the sliding voting keys or selectors **24** and after he is satisfied with the selections made, he depresses a VOTE switch **170** on the voting machine **20** which completes a circuit to the rectifier **148** and coil **147** to advance the latter from the fifth step to the sixth. The latter circuit extends from the line **126** through the lamp **166**, through a conductor **179** to the party vote control **155** where this conductor is connected through a switch (not shown) to another conductor **180**. When the stepping switch **145** reaches its sixth position contacts **145***c* and **145***d* are in their B positions while the remaining contacts of the stepping switch are in their A positions. Line conductor **127** is connected through contacts **145***c* and **145***d* and through the limit switch section **157***b* to the winding **136**, thus energizing the drive motor for the scanning rail to drive the latter from the top of the voting machine **20** to the bottom and, at the same time, to lower the curtain over the front panel **23**. During the movement of the scanning rail, in its vote sensing sweep, the counters are actuated to record the voter's selections.

When the scanning rail leaves its upper position the switch section **157***a* reverts to the position shown in FIG. 10 whereupon the lamp **166** is extinguished and the power to the transformer **165** is interrupted so that all of the column lights **159–1**, etc., are turned off. When the scanning rail has completed its vote sensing sweep switch **157***b* interrupts the drive to the motor winding **136** and applies a voltage to the rectifier **148** and the coil **147** to advance the stepping switch to its seventh position wherein contacts **145***a* and **145***e* are in their B positions while contacts **145***b*, **145***b'*, **145***c* and **145***d* are in their A positions. Contacts **145***e* connect the line **127** through a conductor **181** of the cable **21** and through the release solenoid **114** to the conductor **131** and line **126**, thus energizing the release solenoid to restore the remote unit **22** to its original condition in the manner described above. When the solenoid **114** is energized all of the push button switches **25–1**, etc., and the START switch **51** are returned to their original positions by the coil springs **85**. At any time prior to depression of the START switch during the adjustment of the remote unit by the precinct officials the solenoid **114** may obviously be energized by depressing the release switch **120** to connect the solenoid to the conductor **154** and, hence, to the line **127**. The stepping switch self steps from the seventh position through the eighth and ninth positions and back to the original or home position. The latter three positions may be termed the remote unit release portion of the cycle since the remote unit **22** is being restored to its initial condition during this period. After the stepping switch **145** reaches the home position the voting machine and the remote unit are in condition for use by the next voter.

While a particular embodiment of the invention has been illustrated and described, it will be recognized 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 as new and desired to be secured by Letters Patent of the United States is:

1. In a voting machine of the type including a plurality of manually operated selectors for permitting the voter to make selections, means for registering the selections made by the voter, and electrically operated means for rendering different groups of selectors effective to actuate the registering means with the different groups respectively corresponding with different classifications of voters, the improvement which comprises electrical circuit means including a plurality of manually depressible voter classification switches each representing a different voter classification and each movable between operated and inoperative positions, said circuit means further including electrical sub-circuits interconnecting said voter classification switches and said electrically operated means, means mechanically interlocking said plurality of voter classification switches so that only one of them may be operated for a particular voter, said circuit means causing said electrically operated means to render effective only the group of selectors corresponding to the classification of the particular voter as represented by the operated voter classification switch, locking means for holding the

operated voter classification switch in its operated position, operation of any other of said voter classification switches operation of any other of said voter classification switches for automatically returning the previously operated voter classification switch to an inoperative position, said circuit means including further manually operated switch means for rendering the registering means effective, and a latch operated by said further switch means for holding the operated voter classification switch in its operated position.

2. The apparatus defined by claim 1 wherein said latch includes means for preventing operation of any other voter classification switch during the vote registering operation.

3. In a voting machine of the type including a plurality of manually operated selectors for permitting the voter to make selections, means for registering the selections made by the voter, and electrically operated means for rendering different groups of selectors effective to actuate the registering means with the different groups respectively corresponding with different classifications of voters, the improvement which comprises electrical circuit means including a plurality of manually depressible voter classification switches each representing a different voter classification and each movable between operated and inoperative positions, said electrical circuit means further including electrical subcircuits interconnecting said voter classification switches and said electrically operated means, said voter classification switches being operable independently of each other so that all of them or any one of them may be selectively operated for a particular voter, said circuit means causing said electrically operated means to render effective only the groups of selectors corresponding to the classification of the particular voter as determined by the operated voter classification switches, locking means for holding each of the operated voter classification switches in its operated position, said circuit means including additional manually operated switch means for rendering the registering means effective, and a latch operated when the latter switch means is rendered effective for holding each of the operated voter classification switches in its operated position.

4. The apparatus defined by claim 3 wherein said latch includes means for preventing operation of any additional voter classification switches during the vote registering operation.

5. The apparatus defined by claim 3 wherein means including a further manually operated switch connected in said circuit means are provided for selectively releasing all of the operated voter classification switches and for returning them to their inoperative positions, said further switch being selectively operable at any time prior to actuation of said additional switch means and said circuit means including means for rendering said further switch ineffective during the vote registering operation.

6. The apparatus defined by claim 3 wherein said circuit means includes means for automatically releasing said latch when the vote registering operation has been completed.

7. The apparatus defined by claim 6 wherein said latch includes means for preventing operation of any other voter classification switch during the vote registering operation.

8. The apparatus defined by claim 6 wherein said latch includes means for preventing operation of any other voter classification switch during the vote registering operation.

9. In a voting machine of the type including a plurality of manually operated selectors for permitting the voter to make selections, means for registering the selections made by the voter, and electrically operated means for rendering different groups of selectors effective to actuate the registering means with the different groups respectively corresponding with different classifications of voters, the improvement which comprises electrical circuit means including a plurality of manually depressible voter classification switches each representing a different voter classification and each movable between operated and inoperative positions, said electrical circuit means further including electrical subcircuits interconnecting said voter classification switches and said electrically operated means, said voter classification switches being operable independently of each other so that all of them or any one of them may be selectively operated for a particular voter, said circuit means causing said electrically operated means to render effective only the groups of selectors corresponding to the classification of the particular voter as determined by the operated voter classification switches, locking means for holding each of the operated voter classification switches in its operated position, and means including a further manually operated switch connected in said circuit means for releasing all of the operated voter classification switches and for returning them to their inoperative positions.

10. In a voting machine of the type including a plurality of manually operated selectors for permitting the voter to make selections, means for registering the selections made by the voter, and electrically operated means for rendering different groups of selectors effective to actuate the registering means with the different groups respectively corresponding with different classifications of voters, the improvement which comprises electrical circuit means including first and second groups of manually operated voter classification switches, each voter classification switch representing a different voter classification and each movable between operated and inoperative positions, said circuit means further including electrical subcircuits connecting said voter classification switches to said electrically operated means, means interlocking the voter classification switches of the first group so that only one of them may be operated for a particular voter, the voter classification switches of the second group being operable independently of each other and independently of the voter classification switches of the first group so that any one, or all of the voter classification switches of the second group may be operated for a particular voter, said circuit means causing said electrically operated means to render effective only those selectors corresponding to the classifications of the particular voter as determined by the operated voter classification switches of the two groups, locking means for holding the operated voter classification switch of the first group in its operated position, said locking means including structure actuated by operation of any other of the voter classification switches of the first group for returning any previously operated voter classification switch of the first group to its inoperative position, said circuit means including further manually operated switch means for rendering the registering means effective, and a latch operated by the latter switch means for locking the operated voter classification switches of both groups in their operated positions.

11. The apparatus defined by claim 10 wherein said latch includes means for preventing operation of any other voter classification switch of either group during the vote registering operation.

12. In a voting machine of the type including a plurality of manually operated selectors for permitting the voter to make selections, means for registering the selections made by the voter, and electrically operated means for rendering different groups of selectors effective to actuate the registering means with the different groups respectively corresponding with different classifications of voters, the improvement which comprises electrical circuit means including first and second groups of manually operated voter classification switches, each voter classification switch representing a different voter classification and each movable between operated and inoperative positions, said circuit means further including electrical subcircuits connecting said voter classification switches to said electrically operated means, means interlocking the voter clas-

sification switches of the first group so that only one of them may be operated for a particular voter, the voter classification switches of the second group being operable independently of each other and independently of the voter classification switches of the first group so that any one, or all of the voter classification switches of the second group may be operated for a particular voter, said circuit means causing said electrically operated means to render effective only those selectors corresponding to the classifications of the particular voter as determined by the operated voter classification switches of the two groups, locking means for holding the operated voter classification switch of the first group in its operated position, said locking means including structure actuated by operation of any other of the voter classification switches of the first group for returning any previously operated voter classification switch of the first group to its inoperative position, means for holding each operated voter classification switch of the second group in its operated position, and means including further manually operated switch means connected in said circuit means for releasing all of the operated voter classification switches of both groups and for returning them to their inoperative positions.

13. The apparatus defined by claim **12** wherein said circuit means includes an additional manually operated switch for rendering the registering means effective and wherein a latch operated by said additional switch is effective to lock all of the operated voter classification switches of both groups in their operated positions.

14. The apparatus defined by claim **12** wherein said circuit means includes means for automatically releasing said latch when the vote registering operation has been completed.

15. The apparatus defined by claim **13** wherein said further switch means is selectively operable at any time prior to actuation of said additional switch, and said circuit means including means rendering said further switch means ineffective during the vote registering operation.

16. The apparatus defined by claim **14** wherein said latch includes means for preventing operation of any voter classification switch of either group during the vote registering operation.

17. The apparatus defined by claim **15** wherein said latch includes means for preventing operation of any voter classification switch of either group during the vote registering operation.

18. The apparatus defined by claim **15** wherein said circuit means includes means for automatically releasing said latch when the vote registering operation has been completed.

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LEO SMILOW, *Primary Examiner.*

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,207,429 September 21, 1965

Edward J. Crossland et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 17, line 2, strike out "operation of any other of said voter classification switches" and insert instead -- tion, said locking means including structure actuated by --; column 19, line 31, for the claim reference numeral "12" read -- 13 --.

Signed and sealed this 27th day of September 1966.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents