J. H. McELROY.

VOTING MACHINE.

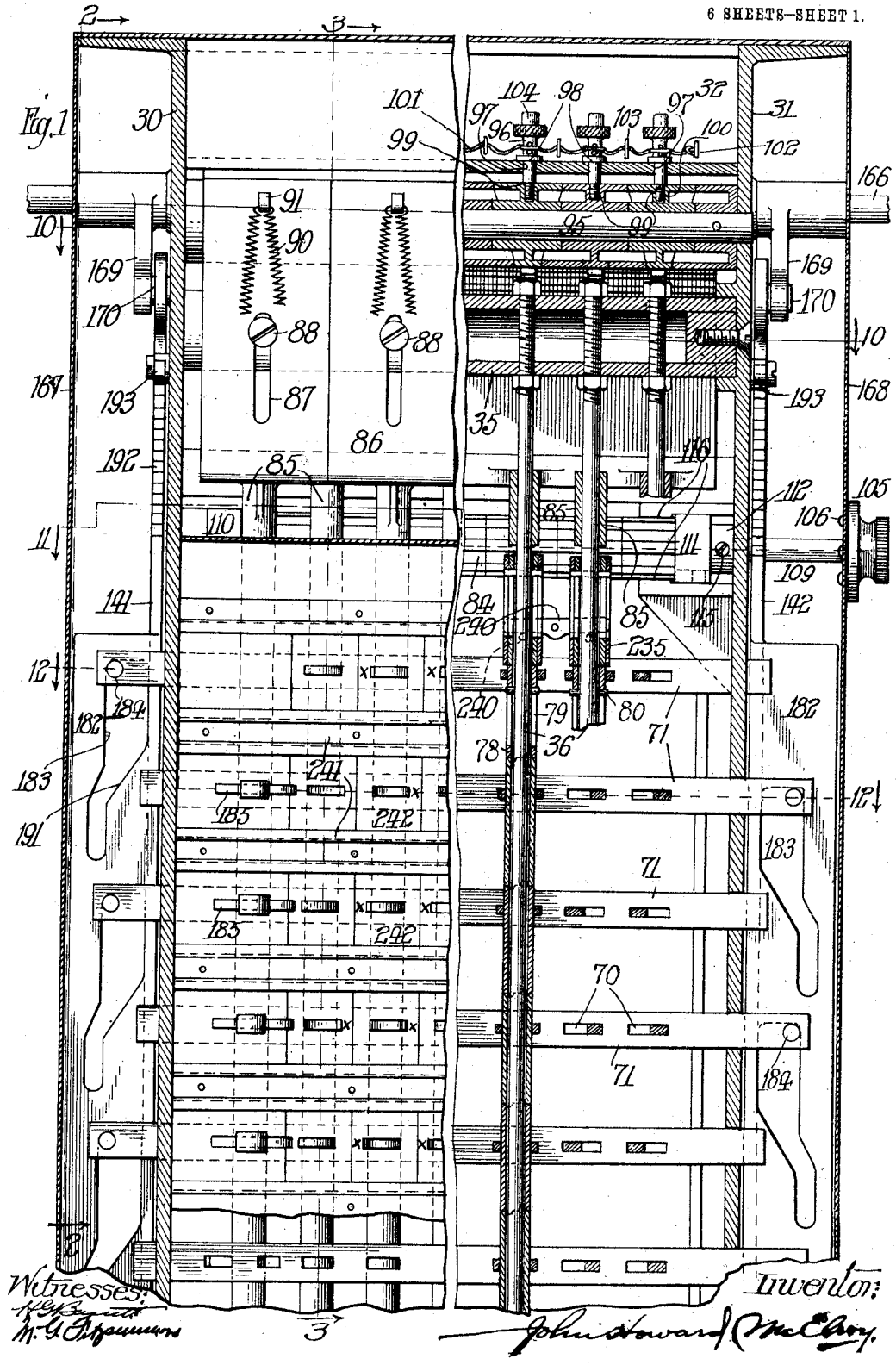
APPLICATION FILED APR. 29, 1908.

982,736.

Patented Jan. 24, 1911.

6 SHEETS—SHEET 1.

Fig. 1



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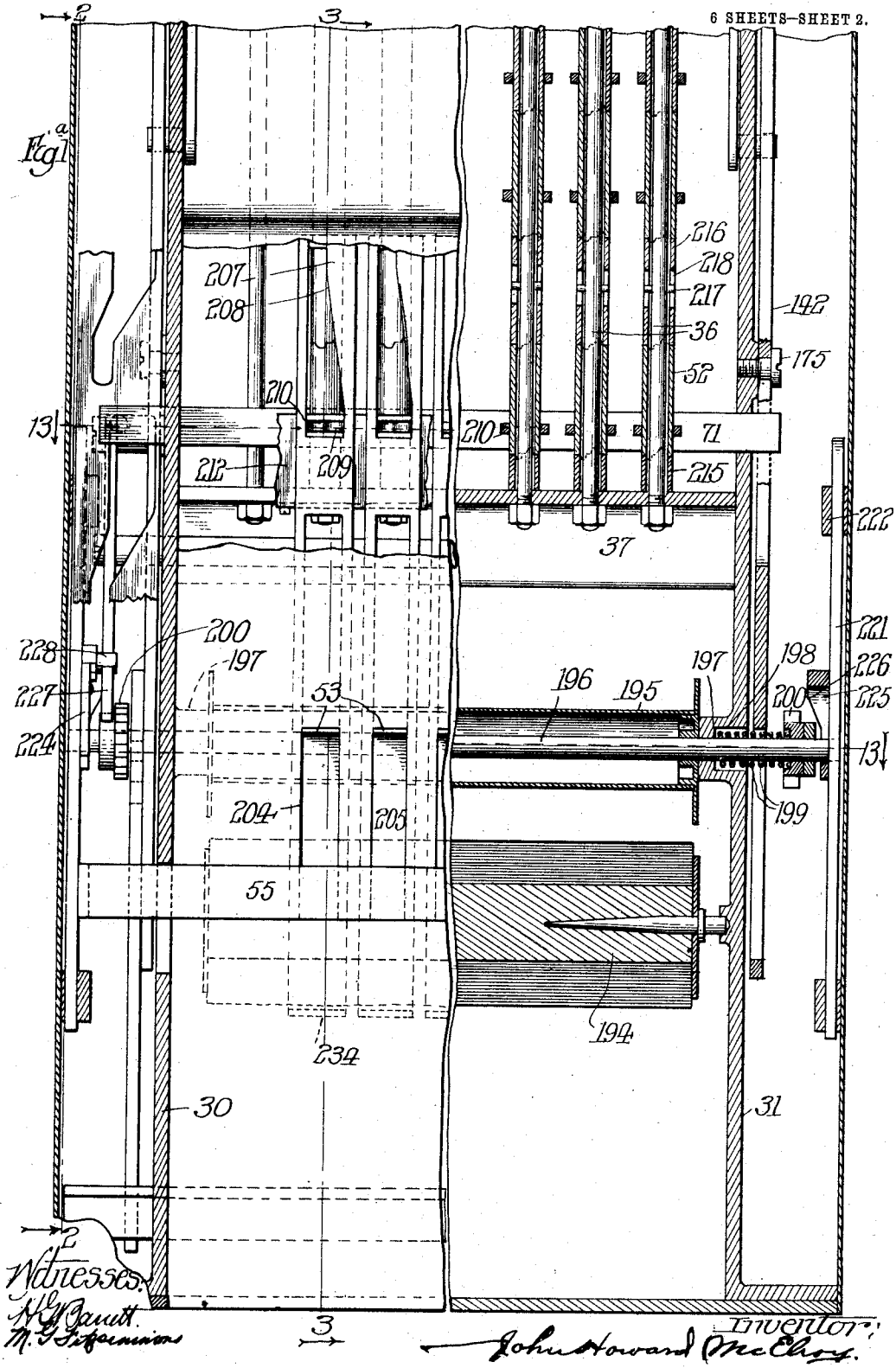

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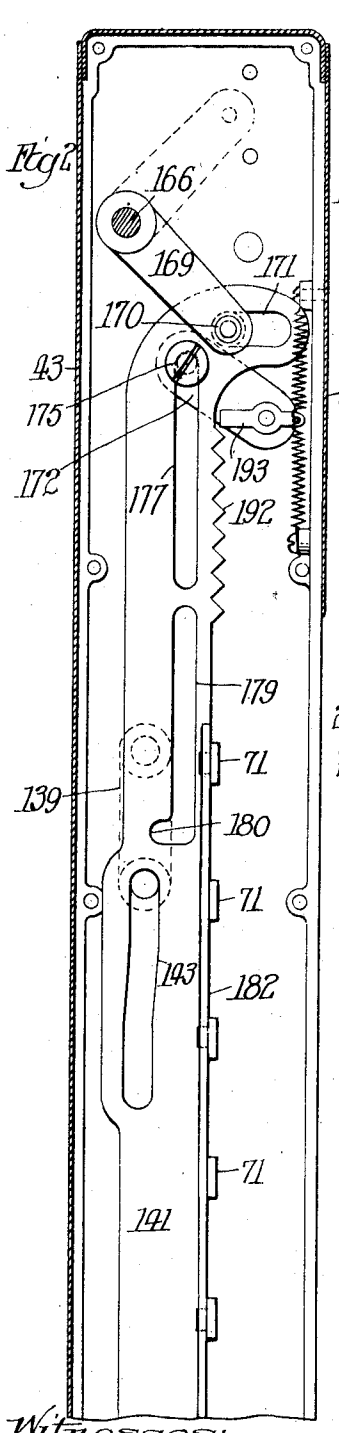

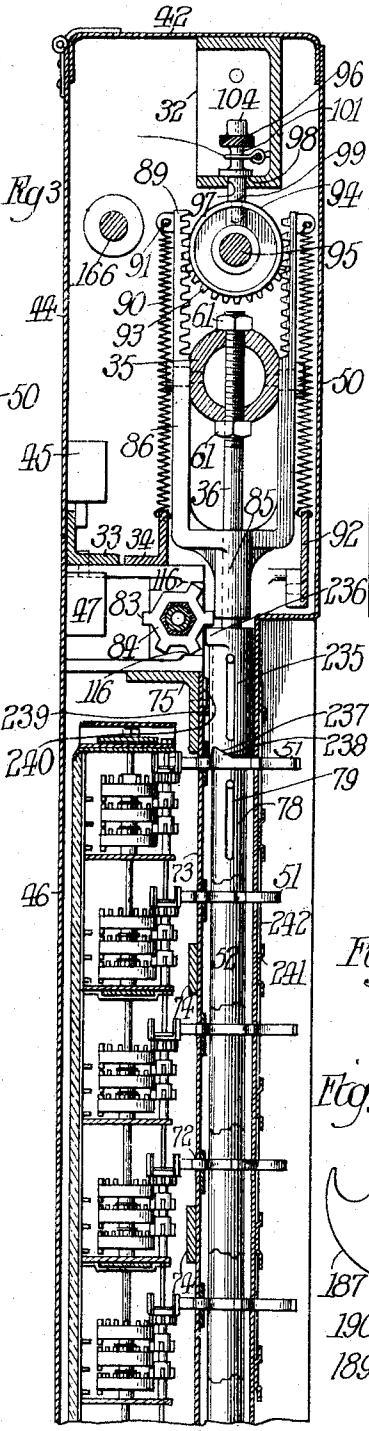

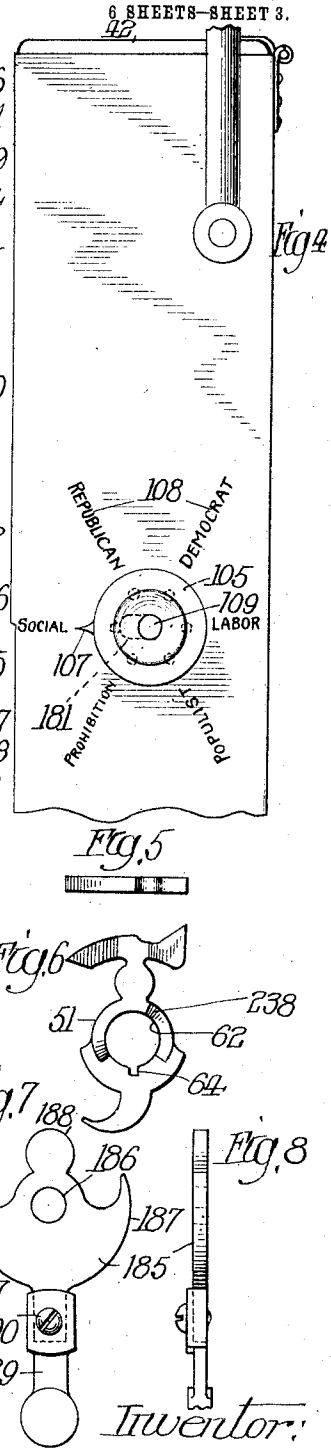

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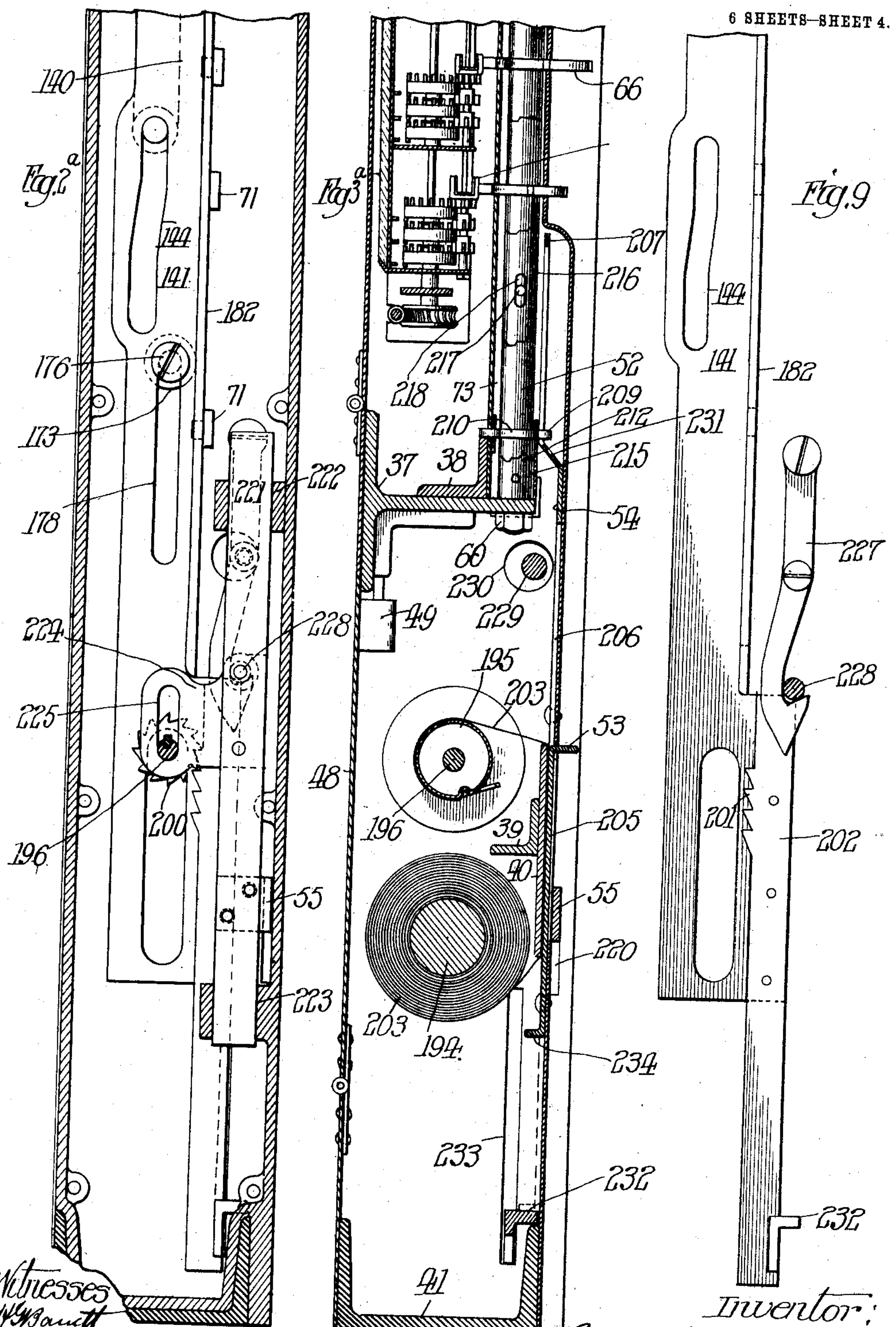

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6 SHEETS—SHEET 5.

Fig. 10

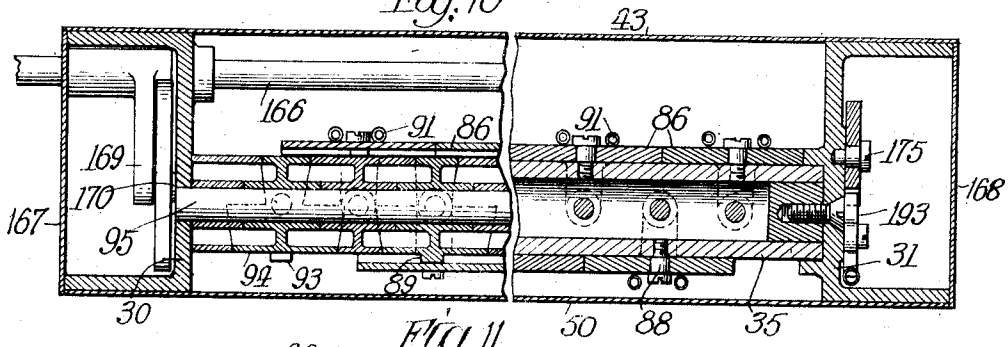


Fig. 11

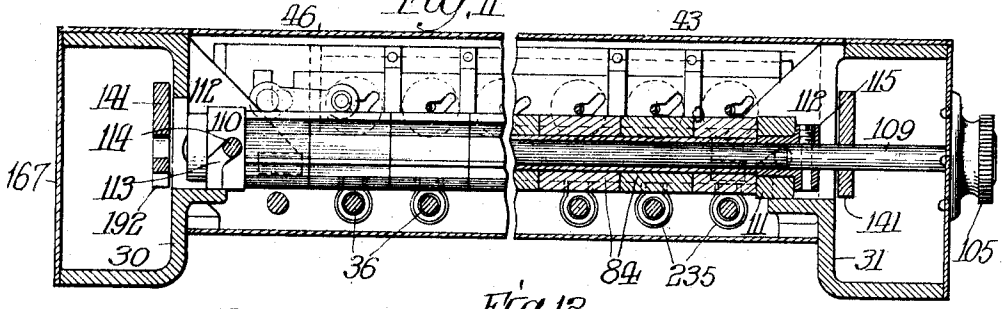


Fig. 12

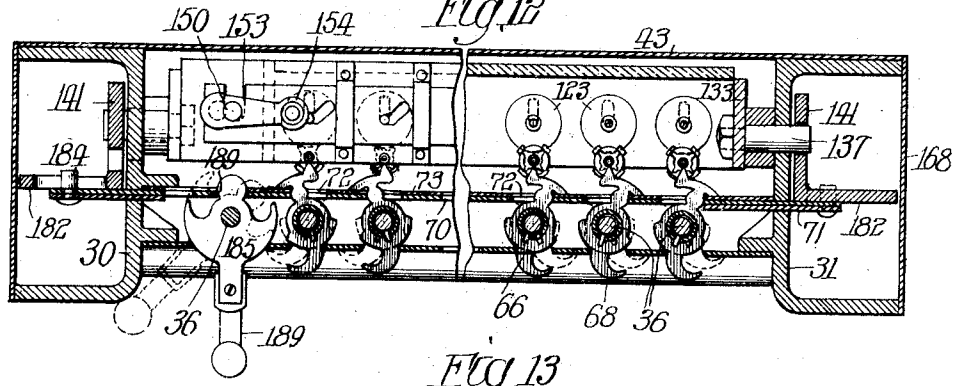
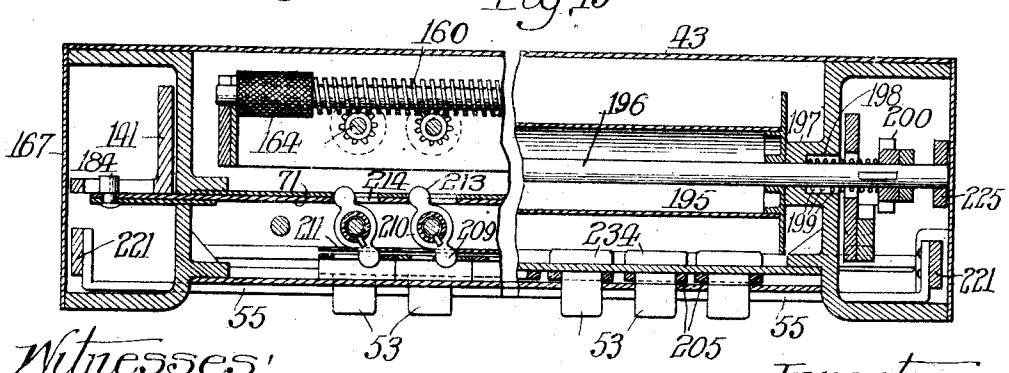


Fig. 13



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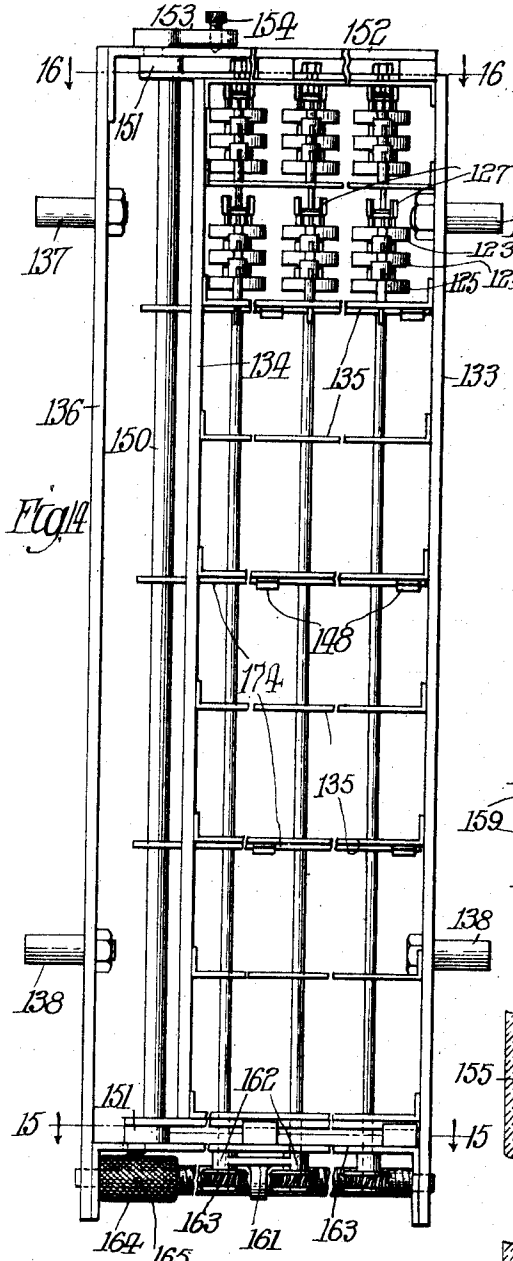

Fig. 14

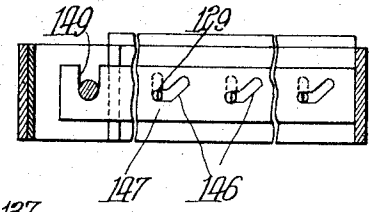

Fig. 16

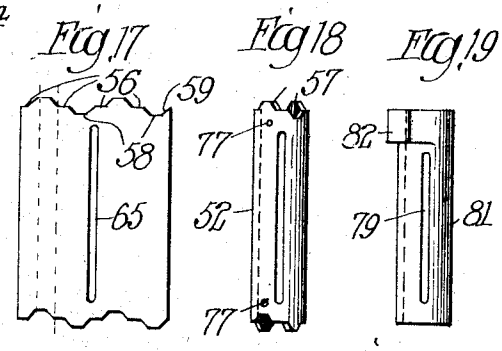

Fig. 17 Fig. 18 Fig. 19

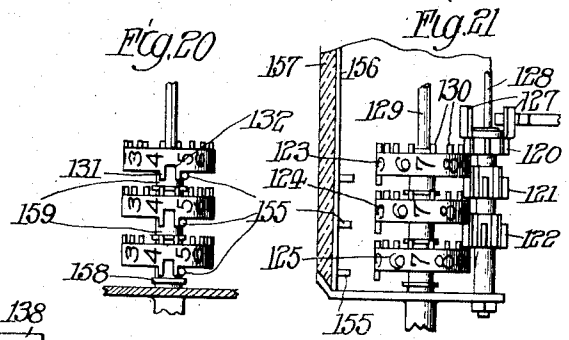

Fig. 20 Fig. 21

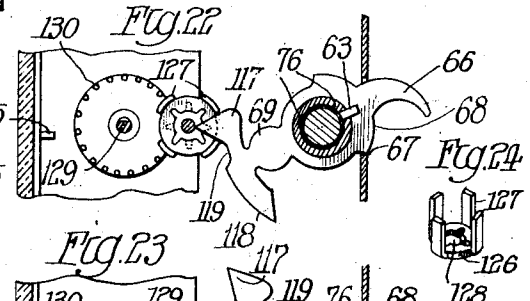

Fig. 22 Fig. 24

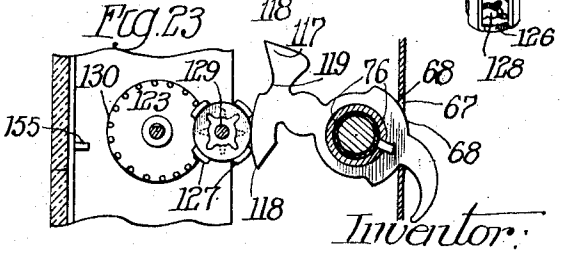

Fig. 23

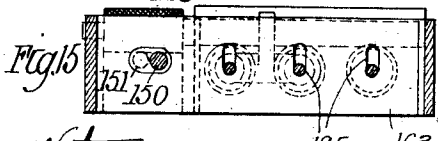

Fig. 15

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UNITED STATES PATENT OFFICE.

JOHN HOWARD McELROY, OF CHICAGO, ILLINOIS.

VOTING-MACHINE.

982,736. Specification of Letters Patent. **Patented Jan. 24, 1911.**

Application filed April 29, 1908. Serial No. 429,976.

To all whom it may concern:

Be it known that I, JOHN HOWARD McELROY, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Voting-Machines, of which the following is a full, clear, and exact specification.

My invention is concerned with voting machines of the type adapted for use in general elections, and comprises (1) a novel interlocking mechanism adapted to be interchangeably used for single-candidate and multi-candidate-to-be-elected groups, as occasion may demand; (2) a novel resetting mechanism, parts of which may be combined with the straight-ticket mechanism, when the latter is employed, thereby reducing the number of necessary parts; and, finally, certain novel features concerned with voting-mechanism generally.

To illustrate my invention, I annex hereto six sheets of drawings, in which the same reference characters are used to designate identical parts in all the figures, of which,—

Figure 1 is a front elevation of the upper portion of the machine, with a portion of the left-hand side in section just inside of the casing, and with the right-hand side in section along the vertical plane of the interlocking sleeves; Fig. 1ª is a similar view of the lower portion of the machine; Fig. 2 is a vertical section on the line 2—2 of Fig. 1; Fig. 2ª is a similar view on the line 2—2 of Fig. 1ª; Fig. 3 is a vertical section on the line 3—3 of Fig. 1; Fig. 3ª is a similar view on the line 3—3 of Fig. 1ª; Fig. 4 is an end elevation of a portion of the top of the machine, as seen from the right-hand side of Fig. 1; Figs. 5 and 6 are end and top plan views of one of the yes and no keys; Figs. 7 and 8 are a top plan view and side elevation of one of the straight-ticket keys; Fig. 9 is a detached view of a portion of the operating bars and mechanism shown in Fig. 2ª; Fig. 10 is a plan view in horizontal section on the line 10—10 of Fig. 1; Fig. 11 is a similar view on the line 11—11 of Fig. 1; Fig. 12 is a similar view on the line 12—12 of Fig. 1; Fig. 13 is a similar view on the line 13—13 of Fig. 1ª; Fig. 14 is a rear elevation of the register-supporting frame, with portions thereof broken out; Fig. 15 is a detail of the same in section on the line 15—15 of Fig. 14; Fig. 16 is another section of the same on the line 16—16 of Fig. 1; Fig. 17 is a view of the blank from which the inter-locking sleeves are rolled up; Fig. 18 is a view of one of the interlocking sleeves rolled up from the blank shown in Fig. 17; Fig. 19 is a side elevation of a transmitting sleeve in the interlocking series, which coöperates with the limited-franchise mechanism; Fig. 20 is a view in front elevation of one of the registers on a larger scale than is shown in the other figures; Fig. 21 is a similar view of one of the registers in side elevation; Fig. 22 is a top plan view of one of the registers and its associated operating key, with the key in unoperated position; Fig. 23 is a similar view, but with the key moved into operated position; and Fig. 24 is a perspective view of the register member which is engaged directly by the operating key.

In carrying out my invention, I preferably employ the generally rectangular casing, which is provided at its ends with the vertically-disposed trough-like end-pieces 30 and 31. These end pieces are connected by the various horizontal members, such as the trough-like casting 32, which is of the general shape of a channel bar, and which is used for supporting and adjusting the secondary interlocking elements, as may be desirable in arranging the registers for single or multi-candidate-to-be-elected groups; the small angle-irons 33 and 34 near the top, which have functions to be described; the heavy tube 35, which also serves to support the vertical bearing rods 36 for the primary interlocking elements; the heavy T-bar 37, with the angle iron 38 secured thereto, which T-bar serves as a support for the lower ends of the rods 36; the angle iron 39, which also serves as a support for the irregular-ballot writing-plate 40; and the heavy channel bar 41, which forms the bottom of the casing. There is a thin metallic top piece or covering 42, and the rear wall 43 is made of sheet metal, and provided with the door 44 for giving access to the adjusting mechanism for the single or multi-candidate groups, which door is provided with one or more locks 45, the bolts of which coöperate with the angle iron 33; also the door 46, which gives access to the register frame in order to permit the reading of the totals, and which door is provided with one or more locks 47, the bolts of which conveniently co-

operate with slots in the angle iron 33; and, finally, the door 48, which gives access to the irregular balloting mechanism, and which is provided with one or more locks 49, the bolts of which conveniently coöperate with the T-bar 37. The front wall 50 is also constructed of sheet metal, and the top portion is flush with the outer surface of the end pieces 30 and 31, while its central portion is inset, so as to bring the keys 51 in the immediate vicinity of the interlocking sleeves 52 with which they coöperate in the manner to be described; and the lower portion of the front wall is located in a vertical plane about half way between the vertical planes of the top portion and the middle portion, and is sufficiently inset to furnish protection for the projecting lips 53 of the irregular ballot slides 54.

By the construction shown, it will be apparent that the keys 51 and the projecting portions 53 of the irregular ballot slides, as well as the bar 54 with which said slides cooperate, are located within the recess, as it were, formed between the end troughs or pieces 30 and 31, so that these parts are protected in a manner that they would not be if they projected beyond the general exterior of the machine.

The interlocking mechanism to prevent the simultaneous operation of more than the permissible number of keys in any office group is a modification of the interlocking mechanism shown in my application No. 358,815, filed February 23, 1907. In that application are shown thin, disk-like interlocking-members having surfaces in three different planes, and inclined cam portions connecting the different portions, so that when adjacent disks are rotated in opposite directions, they will be separated by bringing the different surfaces into engagement, thereby taking up any space that is allotted for the number of candidates to be voted for in the group. In that construction, the entire series of interlocking elements were arranged in one continuous row across the bottom of the machine, and this arrangement necessitated the connecting of these interlocking elements with the keys by straps of different lengths, according to the position of the row of keys to which the straps were connected. In my present construction, I provide a set of primary interlocking elements 52 for each office row of keys, and the end members of these primary interlocking elements coöperate with a transverse row of secondary interlocking elements, each primary row moving its associated secondary interlocking element a distance proportional to the number of keys moved for operation in its primary row. By suitably securing the secondary interlocking elements in the position to which they would be moved by the operation of a single key in that primary row, all of the office rows may be employed for single-candidate-to-be-elected groups, and by loosening the secondary interlocking elements, the various office rows may be thrown into groups permitting the operation of as many keys anywhere in the group as there are secondary interlocking elements loosened.

As shown in Figs. 1, 3, 15, 18, 22 and 23, the primary interlocking elements 52 consist of elongated sleeves, which are preferably formed from sheet metal by first stamping out a blank, as shown in Fig. 17, which is subsequently formed into the sleeve form shown in Fig. 18, by means of suitable drawing dies. These sleeves have their ends formed with four equi-distant surfaces 56 on the same plane, two equi-distant surfaces 57 on a plane above the four planes 56, and two equi-distant surfaces 58 on a plane as far below the plane of the surfaces 56 as the plane of the surfaces 57 is above the plane of the surfaces 56. These surfaces 56, 57 and 58 are connected by the inclined cam surfaces 59, and the arrangement is such that when turned in their normal, unoperated positions, the ends of the sleeves nest in the ends of the adjacent sleeves, so that they take up a minimum of space. I may state that after the blanks have been rolled into the sleeve shape shown in Fig. 18, their ends are struck by dies, which serve to insure all of the ends being of uniform formation. All the eight essential sleeves 52 for each office group (there being seven sleeves for the regular candidate keys, if that many are provided for by law, and one sleeve for the irregular balloting mechanism of the group) are mounted to slide and rotate upon the bearing rod 36, the lower end of which is secured to the T-bar 37, as by the nuts 60 cooperating with the threaded end of the rod, and the upper end of which is secured to the tube 35, being passed therethrough, and held in place by the nuts 61 coöperating with the threaded end of the rod. The various rods 33 are spaced apart an equal distance, and the keys 51 are mounted to rotate about the rods 36 as an axis, being provided with the central apertures 62 of the proper diameter so that the sleeves 52, which slide and rotate on the rods 36, will be free to slide in the keys 51, but are held from rotation therein by reason of the spline 63, which coöperates with the recess 64 in the key, and with the slot 65 in the sleeve. This spline 63 has the vertical portion coöperating with the slot 65 and the recess 64, and the horizontal end pieces projecting slightly beyond the recess 64 so as to prevent the key, spline and sleeve being separated after they are once assembled upon the rod 36. The keys 51 are also supported and held from vertical movement by reason of the ends 66 passing through the slots 67 in the front 50 of the casing, and it

will be noted, especially from Fig. 12, that the ends 66 of the alternate rows of keys are directed in the opposite direction, the pointed ends of the keys extending down over the name of the candidate on the ballot to which the key is devoted, when the key has been moved to operative position. The end of the key thus serves as a pointer or index to emphasize the location of the name of the candidate with which the key is associated, and it will be understood that the ends of the alternate rows of keys are pointed in the opposite directions for the reason that the sleeves 52 must be rotated in alternate directions for simplicity in structure. The keys are also provided with the curved portions 68, which are struck on an arc of sufficient radius so that the surface will project into the slot 67 and prevent any implement being inserted into the casing through the slots. The rear end of the key is provided with the portion 69, which passes through the slots 70 in the straight-ticket and resetting bars 71. These portions 69 have their edges curved on the arcs of small circles, as shown, so that these portions of the keys will coöperate with the straight edges of the recesses 70 in whatever angle the key may be swung through, it being understood that the keys are swung through an angle of forty-five degrees at each operation, where the sleeves have the eight surfaces 56, 57 and 58 at each end. The portions 69 of the keys pass not only through the slots 70 in the resetting bars 71, but they also pass through slots 72 in the vertical plate 73, which extends between the end pieces 30 and 31, being secured thereto in any suitable manner. As this vertical plate 73 is of thin metal, I preferably increase its rigidity by securing to it the strips 74 at suitable intervals extending across the machine and connected to the end pieces 30 and 31. The top of this plate 73 is secured to the angle iron 75, which extends across the machine and is secured to the end pieces 30 and 31, and the bottom of this plate is secured to the angle bar 38, which in turn is secured to the T-bar 37.

By reason of the keys being journaled, as it were, on the rods 36, and held from vertical movement by the slots 69 and 72, it will be apparent that the keys can be swung through the forty-five degrees permitted to each. As each key is swung from its normal unoperated position to its operated position, it rotates the sleeve 52, which it embraces, with it, and the action of the cam surfaces on the end of the sleeve with the cam surfaces on the top of the sleeve below and the bottom of the sleeve above, serves to lengthen the column of sleeves by the unit distance for each operated key. The slots 65 are employed so that the sleeves, and especially the top ones, may be raised as many unit distances as the number of keys in the group will permit. For instance, if the particular column of keys under consideration were in a multi-candidate-to-be-elected group where at least eight candidates were to be elected, it might happen that each one of the sleeves 52 in that group was rotated, the lowermost one by the irregular ballot mechanism, and the seven upper ones by reason of the regular party candidate keys being operated. This would necessitate the lowermost sleeve having a raising effect of one unit, and the uppermost sleeve would have a raising effect of eight units. In order to reduce the friction of these sleeves 52 on the rods, I preferably make their internal diameter somewhat larger than the diameter of the rod 36, and form three bearing surfaces 76 on the inner faces of the sleeves at the top and bottom by striking depressions 77 into the exterior of the sleeves, producing the corresponding bearing surfaces 76 on the interior of the sleeves.

The expanding effect of the operation of the keys in the office column is transmitted to the secondary interlocking mechanism by means of a non-rotating sleeve 78, which is provided with the similar cam surfaces on its lower edge, and which is provided with a vertical slot 79, through which passes a pin 80 secured in the rod 36, so as to prevent the turning of the sleeve on the rod while not interfering with its upward movement thereon. Above this sleeve 78 is another sleeve 81, which might, in fact, be a continuation of the sleeve 78 as the two sleeves might be consolidated. This sleeve 81 is similar to the sleeve 78, in that it has the slot 79, by which it is similarly held from movement, but its lower end may be plain to coöperate with the plain upper end of the sleeve 78. The top of the sleeve 81 is preferably provided with the arms 82, which may be struck out of the body of the metal, and which extend into the plane of the lugs 83 on the franchise-limiting elements 84, the construction and operation of which will be explained further on. The top of the sleeve 81 coöperates with the tubular lower end 85 of the rack bar 86, and it will be understood that the tubular lower end of the rack bar slides on the rod 36 as a bearing, and I preferably form another bearing by smoothing off the surface of the tube 35 on each side, and forming the vertical slots 87 in the bodies of the rack bars, and I pass a shouldered screw 88 through each of the rods 87 and into the flattened surface of the heavy tube 35. This additional bearing serves to overcome any tendency of the rack bar to be thrust away from the coöperating teeth of the secondary interlocking element. The edges of the rack bars or plates 86 abut against each other,

and they are provided with teeth 89, extending across the top thereof, and they are normally held downward by the tension of the helically-coiled contractile springs 90, which are secured to the lugs 91 at the tops of the rack bars, and the lower ends of the springs 90 of the rack bars on the rear are secured to the angle iron 34, while the lower ends of the springs 90 for the other rack bars are secured to the strip 92, which is placed across the front of the machine between the end pieces 30 and 31 for this purpose. The teeth 89 of these rack bars 86 mesh with the teeth 93 of the secondary interlocking sleeves 94, which, like the primary sleeves, have cam surfaces at their ends, and are adapted to be rotated in alternate directions, but instead of being rotated through a certain distance at each operation, as are the primary elements, they are arranged to be rotated through varying angles, depending upon how many keys have been operated in that associated column. I have shown the sleeves 94 as designed to be rotated through an angle of ninety degress when all eight of the primary sleeves 52 in their associated column have been operated, and to be rotated through only one-eighth of that angle when one primary sleeve has been operated, and so on throughout.

In Figs. 1 and 10, which represent the sleeves 93 in the position they would assume when one key had been operated in each group, or in the position they would be sesecured when they are arranged in single-candidate-to-be-elected groups, it will be seen that there is no play between the sleeves, as they fit snugly against each other. If they be unloosened, so as to throw them in a multi-candidate-to-be-elected group, and if none of the keys in the group be operated, the springs 90 will rotate them in the proper direction so as to produce a certain amount of lost motion or space between the sleeves. That is to say, the sleeves are not quite long enough to entirely fill up the space which they occupy on the rod 95 upon which they are strung. If any one of these sleeves 94 be rotated through a peripheral distance corresponding to the amount that the primary column is raised by the swinging of one of the sleeves 52, the expanding action due to the shape of its cam edges will take up the lost motion which belongs to that particular sleeve, and if the adjacent sleeves 94 are held from movement, it cannot be rotated any further. If, however, there are eight sleeves in the multi-candidate-to-be-elected group, so that they are free not only to rotate, but to slide longitudinally upon the supporting rod 95, the sleeve being operated can be rotated through a total angular distance of ninety degrees, during which rotation it will have shoved the sleeves on either side thereof a sufficient distance to take up the lost motion permitted in the group, and when this sleeve has been rotated the full ninety degrees, no other sleeve in the group can be rotated at all. Of, course, it will likewise be obvious that each sleeve in the group may be rotated through one-eighth of ninety degrees, or two sleeves can be rotated through forty-five degrees each, or any other possible combination, so that, as a result, any eight of the total number of sixty-four primary sleeves 52 in the group can be operated by their keys, but no more. The fact that the rack bars 86 have teeth across the entire face thereof, and that these teeth will be in engagement with the teeth 93 of the sleeves 94 in any position to which they can be adjusted, insures the proper action of the secondary interlocking mechanism under any operation of the keys that may take place. This mechanism gives a very flexible arrangement, and one that enables me to put any number of primary sleeves 52 in a group that is ever required in actual practice. The proportions of the sleeves 94 shown enable me to place, say, thirty columns in a single group, and if it is desired to place more in a group, it is only necessary to decrease the pitch of the cam ends of the sleeves 94 proportionately, making it, say one half as great as illustrated, if it is desired to put twice as many columns of keys in a group.

The grouping of the sleeves 94 is very readily controlled by means of the screws 96, which have the large milled portion, and the reduced portion which passes through the unthreaded apertures 97 in the bottom of the channel bar 32. The screws 96 have the shoulder 98, which controls their position in the channel, and between the lower threaded end and the portion that extends through the apertures 97 is the shoulder 99, which determines the position to which the sleeves 94 can be drawn by the screws, which, it will be understood, are screwed into the threaded apertures 100 in the tops of the sleeves 94, which apertures are so located that the sleeves must be in the postion in which they would be moved by the operation of one key in their respective party columns before the screw can be put in place. It will be readily understood that the channel bar 32 in effect supports the sleeves 94, so that the rod 95 can be made small in diameter, if desired, thus reducing the friction of the sleeves when they are rotated. When it is desired to form a multi-candidate-to-be-elected group, all that is necessary is to unscrew the screws 96 of the sleeves 94 of the columns of keys which are to be included in the group. To prevent the possibility of the screws 96 being mislaid, I preferably secure them in the machine by a cord

101, which extends between a pair of eyes 102 secured near the ends of the machine to the rear of the channel 32, and also through corresponding eyes 103 located between the screws. The reduced portions of the heads of the screws pass through 8-shaped eyes, one loop of which surrounds the key, while the cord passes through the other loop, and the slack in the cord is sufficient to permit one key to be unscrewed at a time. When the key has been unscrewed, I preferably invert it, and to hold it in position I employ an extension 104 on the top, which is of the proper size to set into the aperture 97 from which the screw has been removed. It will be understood that the sleeves 94 may be of any desired construction to effect the result shown, and I have shown them as having a hub portion of substantially the length equal to the distance between pairs of the rods 36. The cam surfaces, of course, are narrow at one end, and wide at the other.

The franchise-limiting mechanism is best shown in Figs. 1, 2, 3, 4 and 11, where it will be seen to consist of the handle 105, which is provided with a plurality of pins 106, preferably six, projecting from its inner face and adapted to coöperate with six equi-distant and equal sized apertures in the end wall of the casing. The handle is provided with an index or pointer 107, which is adapted to point to the designations 108 of the various franchises. I have shown the machine as arranged for use at a primary election where the parties hold their primary on the same day, and the machine is labeled, in Fig. 4, as adapted for a primary in which the Republican, Democrat, Labor, Populist, Prohibitionist and Socialist parties take part, and it will be understood that a certain section, say ten groups in a sixty-key machine, is given over to each party for the purposes of the primary election. When a Republican voter, for instance, comes to vote at the primary, the handle 105 is turned until the pointer 107 is toward the word "Republican," in which position the shaft 109 is pushed in by the handle 105 to the position shown in Fig. 1. The handle 105 is secured on this shaft 109, which is provided with suitable collars to limit the distance to which it can be pulled out for resetting purposes, as hereinafter described. It is provided at each end with the similar rectangular bearing blocks 110 and 111, the bearing block 110 being at the other end from the handle 105, and sliding in ways 112 projecting inward from the end piece 30, while the bearing block 111 slides in corresponding ways in the other end piece 31. The blocks are held in any suitable manner from rotation with the shaft 73, but, of course, must move longitudinally with said shaft, and are held from turning by reason of their rectangular shape coöperating with the ways. As seen in Fig. 11, each block is provided at the top and bottom with the cam slots 113, with which cooperate pins 114 projecting thereinto from the guide ways 112. These cam slots are preferably provided both on the top and bottom of the bearings, and, with this construction, it will be perfectly apparent that as the shaft 109 is pulled out to reset the franchise-limiting mechanism, it will be moved bodily to the rear of the machine an equal distance, thereby carrying the arms 83 of the limiting elements 84, of which there is one for each column of keys, out of engagement with the lugs 82 previously referred to as formed on the upper ends of the sleeves 81. These franchise-limiting elements 84 are provided with the preferably radial arms 83, which are one less in number than the positions to which the shaft can be adjusted. I have, for convenience, indicated six positions of adjustment and five of these arms or lugs 83. These lugs 83 are spaced apart an equal distance, except that one of them is omitted, as it were, and this enables me to make any desired adjustment of these franchise-limiting elements upon the shaft 109, which preferably has the equi-angular cross section shown between the end pieces 30 and 31, with as many angles as there are adjustments for the shaft. By stringing these elements 81 upon the shaft in any desired arrangement, and securing them at the ends, as by the bearing blocks 110, it will be perfectly apparent that I can arrange it for any desired franchise limitation that may be necessary. As is indicated in Fig. 3, when the door 46 is opened and the set screw 115, which holds the two parts of the shaft 109 together, is removed, I can remove the major portion of the shaft 109 and the franchise-limiting elements strung thereon, as may be necessary for re-arranging them. The ways 112 are provided with the lugs 116 at their inner ends facing each other, and intended to coöperate with the arms 83 of the end elements 84, to assist in preventing the rotation of the shaft 109 in case an effort is made to vote for more officers or individuals than the voter's franchise allows. Of course, it will be understood that when a change in the grouping of the machine is to be made, the door 44 is opened, and access is given to the screws 96 for making any necessary adjustment.

As is seen in Figs. 5, 6, 22 and 23, the inner ends of the keys 51 are generally of an arc shape, and are provided with a tooth or spur 117 at one end of the arc-shaped portion, and with a locking surface 118 which is curved on the arc of a circle with the axis of the rod 36 as a center, and between the tooth 117 and the locking surface

118 is a recess 119. These parts are intended to engage with the primary element of the register-wheel train, which I preferably connect to a carrying pinion 120, which is similar to the carrying pinions 121 and 122 which serve to carry from the units wheel 123 to the tens wheel 124, and from the tens wheel to the hundreds wheel 125. As these carrying pinions are customarily made of a comparatively soft composition used in making what are known as "finished castings", I do not have the key, which is stamped from sheet metal, and consequently hard, coöperate directly with the pinion 120, but secure on this pinion an actuating member 126, which, as seen in Fig. 24, consists of a disk-shaped portion having the four arms 127 turned up from the sides thereof and provided with the star-shaped aperture 128 adapted to fit over the four teeth constituting the upper portion of the carrying pinion 120 upon which it is placed. It will be understood that this member 126 is first blanked out of sheet metal, and the arms 127 are then turned up into a vertical position. The position of the key and the carrying pinion when the key is unoperated is shown in Fig. 22, where it will be seen that the tooth 117 rests between two of the vertical arms 127. Of course, it will be understood that the carrying pinions 120, 121 and 122 are strung on a vertical shaft 128, and that the units, tens and hundreds wheels, 123, 124 and 125, are strung on the shaft 129. Suppose now the key is swung from the position shown in Fig. 22 to that shown in Fig. 23. As the key is turned, the tooth 117 bearing against the arm 127 rotates the pinion 120, the succeeding arm 127 in that case passing into the recess 119. When the pinion 120 has been rotated through ninety degrees, the locking surface 118 comes in engagement with the adjacent pair of arms 127, and locks the pinion from further movement. I may at this point state that when a voter is in the machine, and it is ready for operation, the frame carrying the register wheels is in position so that the teeth 117 can engage the arms 127 to operate the machine. When the voter leaves the booth, the register frame is first moved to the rear far enough to disengage the operating teeth 117 from the arms 127, and while the frame is in this position, the keys are moved back to their normal unoperated position by the movement of the bars 71, by the resetting mechanism to be described. After the keys have been reset, and are held in that reset position, the register frame is then moved back to normal position, and consequently the teeth 117 engage between the arms 127 that are now nearest the key. Of course, it will be understood that if a key has been operated by the voter, as shown in Fig. 23, and he desires to change his vote, all that he has to do is to throw the key back to its unoperated position, when the engagement of the tooth 117 with the arms 127 which it has just passed in the setting operation, will unoperate the register. Of course, it will be understood that the carrying pinion 120 has on its lower half a certain number, say eight, teeth, which engage the continuous row of pins 130, which project upward from the top of each of the wheels. The under side of each of the wheels is provided with the pair of downwardly projecting pins 131 between which is the notch 132, and the parts are so arranged that two of the four long teeth on the carrying pinion coöperating with the periphery of the wheel of lower denomination, locks the pinion from operation until the recess 132 is reached, when the movement of the wheel of lower denomination from 9 to 0 will, by the engagement of the pins 131 with the intermediate one of the short teeth, rotate the carrying pinion through ninety degrees, and it, of course, will carry the wheel of higher denomination, by reason of the engagement of its teeth with the pins 130 projecting upward from the periphery of said wheel of higher denomination.

The shafts or rods 128 are rigidly secured in the register frame made up of the vertical end pieces 133 and 134, which are connected by the horizontal cross pieces 135 between each row of registers. The register frame also has, at the opposite end from the bar 133, another bar 136, and projecting outwardly from the end pieces 133 and 136 are the pair of pins 137 and 138, which are pivoted in the swinging lower ends of the pairs of suspending links 139 and 140, the position of which is indicated in dotted lines in Figs. 2 and 2ª, and which are pivoted at their upper ends upon pins projecting inwardly from the end pieces 30 and 31. The operating bars 141 and 142, to be more fully described hereinafter, are provided with the pairs of slots 143 and 144, which, as seen in Figs. 2 and 2ª, are provided with the cam portions located about midway of their length, so that as the bars 141 and 142 are raised by the means to be described, the register frame will be swung to the rear a sufficient distance to disengage the registers from the operating keys. When the bars 141 and 142 are returned, of course, the reverse action takes place, and the registers are engaged with the keys, which are now in their unoperated position. To reset all the registers in the machine at a single operation, I arrange to move all of the register wheels proper out of engagement with the carrying pinions and to then simultaneously rotate all the shafts 129 until the register wheels are reset. For this purpose, instead of mounting the shafts 129 directly

in the plates 135, I pass them through slightly elongated slots 145 in said plates, and also pass them through cam slots 146 which are placed in a number of auxiliary plates 147, which are mounted to slide in bearings formed on the under sides of such plates 135 as they are next to, as I preferably employ only one-half as many of the plates 147 as of the plates 135. The guides for these plates 147 are conveniently constructed by securing straps 148 on the under sides of the plates 135. Each of the plates 147 has the recess 149 in one end thereof, and a vertical, eccentric shaft 150 passes through all of these recesses and is secured in the arms 151 pivoted at the top and bottom of the frame. The upper arm 151 has secured thereon, above the top piece 152 of the frame, an arm 153, which is preferably provided with a set screw 154, so that it can be secured in different positions. When the register wheels are in their normal positions, the plates 147 are in the position shown in Figs. 15 and 16, and the screw 154 is adjusted to hold them in this position. When the registers are to be reset, the arm 153 is turned so that the plates 147 are drawn to the left as far as the slots 146 will permit their movement, and as they are thus moved, the cam surfaces of the slots will move all the shafts 129 to the rear of the machine as far as the slots 145 will permit. This separates the register wheels from the carrying pinions and brings the pins 131 on all of the wheels into the plane of the pins 155, which project inward from suitable metallic strips 156 secured on the inner face of the glass plate 157 which forms the rear face of the register frame, and through which the readings of the registers can be taken without giving access to the wheels, to prevent any possible manipulation. Owing to the fact that the registers in the alternate horizontal rows must be rotated in opposite directions on account of the different direction of movement of the keys, the pins 155 of the alternate rows are in the position shown in Fig. 20, while in the other rows they would be on the other side of the pins 131 from where they are shown. The head of the lowermost or hundreds wheel 125 rests on a collar 158, and I preferably interpose very thin collars 159 between the units and tens and the tens and hundreds wheels, and to insure the wheels turning with the shaft 129, I preferably flatten these shafts on one side, as shown, and make the apertures in the collars 158 and 159 of the same shape, so that the collars must turn with the shaft 129. As the entire weight of the register wheels rests on these collars, it will be obvious that when the shafts 129 are turned with the wheels freed from the carrying pinions, the wheels will turn with the shaft until the downwardly-projecting pins 131 on each wheel strike the inwardly-projecting pins 155, when the movement of the wheels will be stopped.

With this arrangement, it will be obvious that when the shafts 129 are given a complete rotation all the wheels will have the same reading, which, however, will not be zero. The handle 153 is then turned back far enough toward its original position to a point which will be indicated by a recess for the set screw 154, in which the pins 131 are just out of the plane of the pins 155, and in which the arms 127 have not been brought back into the plane of the teeth 117. At this point, the rotation of the shafts 129 is continued until all the wheels show zero at the reading point, when the rotation of the shafts 129 is stopped and the arm 153 is swung back to its original position, in which the wheels are in engagement with their carrying pinions. As a convenient means for simultaneously rotating all of these shafts 129, I employ the mechanism best shown in Figs. 3ª, 13, 14 and 15, where it will be seen that I journal a screw shaft 160 in bearing brackets 161 which are carried by the lower ends of the shafts 129. These same bearing brackets 161, in addition to furnishing bearings for the screw shaft 160, have the vertical bearings 162 for the lower ends of the shafts 129, and beneath the bearings 162 I secure to these shafts the worm gear wheels 163, with which the screw or worm 160 meshes. To turn the worm 160, I secure on one end thereof the milled end 164, which is preferably provided with the apertures 165, in which a wrench can be inserted in order to apply power more advantageously. It will be evident that as this worm shaft 160 is rotated, it will slowly rotate the worm wheels 163, which in turn will rotate the shafts 129, and that at a rate of speed so slow that it will be impossible to get up sufficient momentum so that the wheels will be advanced independently of the movement of the shafts 129.

To operate the machine when the voter leaves the booth, to finally fix the registration and return the parts to their normal position, I employ the horizontal shaft 166 journaled in bearings formed in the top of the machine in the end pieces 30 and 31, and to this shaft may be secured a swinging bail and curtain. This shaft has secured thereto at each end, inside of the end pieces 30 and 31, between them and the end plates 167 and 168, the arms 169, which have pins 170 projecting into the horizontal slots 171 formed in the top of the bars 141 and 142. These bars are mounted to slide vertically the distance that they will be moved by swinging the shaft 166 through an angle of ninety degrees, or, as shown, from the full-line to the dotted-line position of

Fig. 2. As a convenient and simple bearing for these bars 141 and 142, I provide the bearing surfaces 172 and 173 at the top and toward the bottom of the end pieces 30 and 31, and pass the set screws 175 and 176 through the slots 177 and 178 formed in the bars 141 and 142. The bar 142 must have therein the slot 179 with the offset 180 at the bottom thereof, through which passes the outer portion of the shaft 109, as seen in Fig. 11. This slot 179 and the offset 180 are shown in the bar 141, although they are not necessary therein, but are merely shown for uniformity in design. The offset 180 is to permit the movement of the shaft 109 to the rear when the franchise mechanism is being readjusted, and it will be understood that the end plate 168 is provided with a short horizontal slot 181, indicated in dotted lines in Fig. 4, which slot is always covered by the disk or handle 105. Each of these bars 141 and 142 is provided with the outwardly-projecting flange 182, and, as will be seen in Fig. 1, these flanges are provided with the cam slots 183, the slots being alternated or staggered, as the resetting bars 71 in alternate rows must be moved in the opposite directions, owing to the fact that the keys in alternate rows are swung in the opposite direction from inoperative to operative position. The bars 71 are preferably reinforced and thickened at their ends, which ends pass through suitable apertures in the end pieces 30 and 31, and are provided at one end with the pins 184 which project into the cam slots 183. As seen in Fig. 1, the top portion of these slots is of sufficient width so that the bars 71 can be moved in the proper direction a sufficient distance to set all the keys in any horizontal row in position for a straight-party vote, and, for this purpose, I provide the straight-party keys 185, which are shown detached in Figs. 7 and 8. It will be seen that these keys consist of the main portion, in which is located the bearing aperture 186 by which they are strung on the left-hand rod 36, and they are supported horizontally in slots in the front plate 50 and the intermediate plate 73, which slots correspond to the slots 69 and 72, except that they are larger on account of the larger size of the straight-ticket keys. These straight-ticket keys have the surfaces 187, corresponding to the surfaces 68 on the candidate keys, to fill the recesses through which they pass in the front plate 50 in all positions to which the key can be turned to prevent any implement being inserted. They also have the rear projection 188, which is curved on the arc of a circle, and takes into an aperture 189 of the same width in the bars 71, so that when the straight-ticket key is swung from the position shown in full lines in Fig. 12 to that shown in dotted lines in Fig. 12, its corresponding bar 71 engaging with the extensions 69 of the candidate keys, will swing all said keys to operative position. The outer ends 189 of the keys are preferably removable, and normally held in place by the screws 190, so that when the machine is being shipped there will be no part of it projecting beyond the end pieces 30 and 31.

It will be understood, of course, that the wide tops of the cam slots 183 are provided so that the straight-ticket keys can be manipulated to move the bars 71 without interference, and it will be seen, of course, that the straight-ticket keys of the alternate rows must be moved in opposite directions. When the bars 141 and 142 are raised, the cam slots have no effect on the bars 71 during the first part of the movement and while the register frame is being moved to carry the registers out of engagement with the keys. Toward the latter end of the movement, however, the cam surface 191 comes into engagement with its corresponding pin 184 and draws its particular bar 71 outward to its full limit, and holds it locked in that position by the narrow, vertical lower end of the cam slot so long as the curtain is raised and the machine is open. The movement of this bar to this limited position by reason of the ends of the slots 70 acting on the portion 69 of the candidate keys will move all said candidate keys to their unoperated position and lock them there until the curtain is lowered, when the parts will be restored to the position shown in Fig. 1, ready for another operation.

To prevent any attempt to manipulate the machine by partial movements, I provide on one or both of the bars 141 and 142 the set of teeth 192, which coöperate with the spring-held dog 193 in the customary manner to cause a complete stroke of the bars in both directions.

The irregular-ballot mechanism is best shown in Figs. 1^a, 2^a, 3^a, 9 and 13, where it will be seen that I provide the supply roller 194, which is journaled in suitable bearings in the end pieces 30 and 31. At a suitable distance above this supply roller 194, I journal the storage roller 195, and this roller is provided with the shaft 196, which is journaled in the bearings 197 formed in the end pieces 30 and 31, the projections for which are preferably recessed, as seen at 198, to accommodate one end of the helically-coiled expanding-spring 199, which is interposed between the bottom of the recess and the ratcheted disk 200, which is splined on the shaft 196. The teeth of this ratcheted disk 200, of which there is preferably one on each end, are normally out of the plane of the teeth 201, which are formed on the extension 202 of the bars

141 and 142. The ratcheted disks 200 are adapted to be moved inward against the tension of the springs 199 to bring them into the plane of the teeth 201 when an irregular ballot has been indicated on the machine by mechanism to be described, and it will be understood that as the bars 141 and 142 are raised, if the ratcheted disks 200 have been moved into the plane of the teeth 201, the storage roller 195 will be rotated a sufficient distance to draw a sufficient supply of the paper 203 from the supply roll 194 to the storage roll 195. The paper, of course, passes over the writing plate 140.

The front of the casing is provided, in line with each of the party columns, with the elongated, rectangular recesses 204, which are normally closed by the solid portions 205 of the free balloting plates 54. The operating projection 53 of each plate projects through the top of the corresponding slot 204, and above the projection 53 is a recess 206, which may be brought into register with the recess 204 by shoving down the irregular-ballot plate 54 to the position shown in dotted lines in Fig. 3ª. When the irregular-balloting plate is thus moved down to uncover the paper sheet 203, it accomplishes several things. In the first place, an extension, or, more strictly, the upper portion 207 of the irregular-ballot plate is provided with the cam slot 208, best shown in Fig. 1ª, and into this cam slot 208 projects the rounded end 209 of a member 210, which corresponds in some of its functions to the keys 51. Like the keys 51, it is mounted at its front end in slots 211 in a plate 212 secured at the front end of the T-bar 37, for the purpose of supporting the inner ends of these members 210. Their rear ends 213, which correspond with the portion 69 of the keys, coöperate with the slots 214 in the resetting bar 71 devoted to the irregular-balloting mechanism, and likewise through slots in the rear walls 73 corresponding to the slots 72 through which the portions 69 of the keys pass. When the irregular-balloting slide is pulled down, the cam edge of the slot 208 swings the member 210 through an angle of forty-five degrees, just as a key is swung, and this member is connected to its sleeve 52, the lowermost one in the series, by the slot and spline connection, just as the candidate keys are attached to their sleeves 52. The bottom of this lowermost sleeve 52 has the cam surfaces and cooperates with corresponding surfaces formed on the short sleeve 215 secured to the rod 36 above the horizontal flange of the T-bar 37, and its upper end has the corresponding cams coöperating with the intermediate sleeve 216, which has the cam ends, the same as the regular sleeves 52, but which is held from rotation by means of the pin 217 secured in the rod 36 and coöperating with the vertical slot 218 in said sleeve. Of course, it will be understod that the sleeve 52 might be lengthened until it extended up to the sleeve 52 of the lowermost regular key, in which case the intermediate sleeve 216 could be omitted. It will be apparent that, owing to the width of the cam slot 208 at the bottom, if the voter should attempt to beat the machine by voting for an irregular candidate in a single-candidate-to-be-elected column, and then returning the slide, and attempting to vote a regular-candidate key, he would be prevented, for the reason that the mere returning of the irregular-ballot slide does not turn back its sleeve 52 to release the interlock. These interlocking sleeves are only returned when the machine is reset.

Toward the end of the downward movement of the free-balloting plate, the projection 53 strikes the bar 55, which extends across the front of the machine, and the ends of which extend into the end pieces 30 and 31 through the slots 220 therein. As seen in Fig. 13, the ends of the bar 55 are turned inward and are secured to the vertically reciprocating bars 221, which, as best seen in Fig. 2ª, are mounted to slide in the bearings 222 and 223 formed or secured on the end pieces 30 and 31. These bars 221 have secured thereto and projecting inwardly therefrom the cam plates 224, which have the slot 225 therein through which passes the shaft 196, and the cam portions 226 coöperate with the outer ends of the ratcheted disks 200 to throw them into the plane of the teeth 201 when the bar 55 is thrown down. It will be noted that there is considerable lost motion between the cover plates 54 and the bar 55, so that the interlocking mechanism will be operated before the bar 55 is moved to cause the winding up of the roll, which is necessary to complete the casting of an irregular vote. In order to prevent mischievous persons from operating the bar 55 without having operated any of the free-ballot slides, I provide locking means to prevent the bars 55 from being moved until the free-ballot slides have been moved far enough to operate the interlocking mechanism, so that it will be impossible to actuate the free-balloting mechanism maliciously without losing a vote on the regular-candidate keys. For this purpose, I pivot to the inside of the end pieces 30 and 31 the swinging hooks 227, the hooked lower ends of which coöperate with the pins 228 projecting inwardly from the bars 221. These hooks 227 are connected by a rod 229 passing through the apertures 230 in the end pieces 30 and 31, and extending across the machine in the plane of the cam offsets 231

formed in the free-balloting plates 54. The rod 229 is so located relative to the position of the cam surface 231 when the parts are unoperated that it will not be struck by said cam surface until the interlocking mechanism has been operated. When it is struck by the cam surface during the downward movement of any of the free-balloting plates or covers, it will be seen that it will be swung to the rear so as to carry the hook 227 out of the plane of the pins 228 to allow the downward movement of the bar 55. The extensions 202 are connected at their lower ends by the bar 232, which is conveniently constructed of an angle iron, the horizontal flanges of which are cut off at the ends so that the vertical flange can project through the slots 233 formed in the end pieces 30 and 31. When this bar 232 is raised when the machine is reset, if any of the free ballot plates have been moved, it engages the inwardly turned lower ends 234 thereof to reset them to normal position, and as they are reset, the members 210 are reset by the action of the bar 71 and its cam slot 183.

I have shown all but the top row of registers as devoted to the candidate registers, it being understood that each horizontal row will represent all the candidates for any one party. The top row of registers is devoted to the yes and no questions, and the keys 51 for these registers are not connected with any interlocking sleeves, but the keys of each pair are interlocked by mechanism to be described. It is desirable to arrange the yes and no registers so that they can be used for persons of limited franchise, and to this end, I place outside of the sleeves 81, sleeves 235, which correspond in their general construction to the sleeves 81, except that they are enough larger to surround said sleeves. They have projections 236 corresponding to the projections 82 extending into the plane of the arms 83, and their lower ends are provided with the cam recesses 237, with which coöperate cam projections 239 formed on the top of the keys of this row. To balance the construction, there are preferably two of these cam recesses 237 coöperating with two oppositely-disposed cam-projections 238, and these are arranged so that when a key in this row is operated, the action of the cam projections on the cam surfaces will raise the sleeve 235. If the franchise-limiting mechanism is set to prevent the operation of these particular keys, the projections 236 will engage with the arms 83 before the registers are operated, so that the movement is ineffective. To prevent the simultaneous operation of the two registers of a pair, I provide on the rear of the sleeves 235 the pins 239, which coöperate with the levers 240 pivoted between each pair of sleeves on the top of the plate 73, so that but one of the keys of a pair can be operated. Of course, it will be understood that the front wall is provided with the strips 241, or some similar mechanism secured thereto to form the pockets in which the ballot strips 242 upon which the names are printed can be inserted.

While I have herein shown and described a novel franchise-limiting mechanism, I do not herein claim the same, as the generic subject-matter thereof is claimed in my application No. 358,815, filed February 23, 1907, and the specific details are to be claimed in a subsequent application.

While I have herein shown and described a novel free-balloting mechanism, and likewise a novel mechanism for resetting the registers to zero, I do not herein claim the same, but reserve the subject-matter thereof for future applications.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of modifications, and that I do not desire to be limited in the interpretation of the following claims, except as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. In a device of the class described, the combination with the series of interlocking sleeves having the cam ends, of a support for each of said series of sleeves upon which they can be rotated, a candidate key for each of said sleeves coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position, and stops for the end sleeves of the series.

2. In a device of the class described, the combination with the plural office series of interlocking sleeves having the cam ends constituting the primary interlocking mechanisms, of a support for each of said series of sleeves upon which they can be rotated, a candidate key for each of said sleeves cooperating therewith to rotate it in alternate directions as it is moved to and from its operative position, and secondary interlocking mechanism coöperating with the series of said primary interlocking mechanisms to limit the number of keys that can be operated in the entire series.

3. In a device of the class described, the combination with the plural office series of interlocking sleeves having the cam ends, each series constituting a primary interlocking mechanism, of a support for each of said series of sleeves upon which they can be rotated, a candidate key for each of said sleeves coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position, secondary inter-

locking mechanism coöperating with said primary series to limit the number of keys that can be operated, and means for grouping the elements of the secondary interlocking mechanism as may be desired for single-candidate and multi-candidate-to-be-elected groups.

4. In a device of the class described, the combination with the series of elongated interlocking elements having the cam ends, of a support for each of said series of elements upon which they can be rotated, the candidate key for each of said elements coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position and in the opposite direction to that the adjacent elements in the same series are rotated by their keys, and stops for the end sleeves of the series.

5. In a device of the class described, the combination with the series of interlocking elements having the cam ends, of a support for each of said series of elements upon which they can be rotated, the candidate key for each of said elements coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position and in the opposite direction to that the adjacent elements in the same series are rotated by their keys, and secondary interlocking mechanism coöperating with said series to limit the number of keys that can be operated in the entire series.

6. In a device of the class described, the combination with the series of interlocking elements having the cam ends, of a support for each of said series of elements upon which they can be rotated, the candidate key for each of said elements coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position and in the opposite direction to that the adjacent elements in the same series are rotated by their keys, secondary interlocking mechanism coöperating with said series to limit the number of keys that can be operated, and means for grouping the elements of the secondary interlocking mechanism as may be desired for single-candidate and multi-candidate-to-be-elected groups.

7. In a device of the class described, the combination with the series of elongated interlocking elements having the ends provided with inclined portions connecting the straight portions, of a support for each of said series of elements upon which they can be rotated, a candidate key for each of said elements coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position, and stops for the end elements of the series.

8. In a device of the class described, the combination with the interlocking elements having the ends provided with the inclined portions connecting the straight portions, of a support for each of said series of elements upon which they can be rotated, a candidate key for each of said elements coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position, and secondary interlocking mechanism coöperating with the series of said primary interlocking mechanisms to limit the number of keys that can be operated in the entire series.

9. In a device of the class described, the combination with the interlocking elements having the ends provided with the inclined portions connecting the straight portions, each series constituting a primary interlocking mechanism, of a support for each of said series of elements upon which they can be rotated, a candidate key for each of said elements coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position, secondary interlocking mechanism coöperating with said primary series to limit the number of keys that can be operated, and means for grouping the elements of the secondary interlocking mechanism as may be desired for single-candidate and multi-candidate-to-be elected groups.

10. In a device of the class described, the combination with the elongated interlocking elements having the ends provided with the inclined portions connecting the straight portions, of a support for each of said series of elements upon which they can be rotated, a candidate key for each of said elements coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position and in the opposite direction to that the adjacent elements in the same series are rotated by their keys, and stops for the end sleeves of the series.

11. In a device of the class described, the combination with the interlocking elements having the ends provided with the inclined portions connecting the straight portions, of a support for each of said series of elements upon which they can be rotated, a candidate key for each of said elements coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position and in the opposite direction to that the adjacent elements in the same series are rotated by their keys, and secondary interlocking mechanism coöperating with said series to limit the number of keys that can be operated in the entire series.

12. In a device of the class described, the combination with the series of interlocking sleeves having the cam ends, and means for holding the sleeves yieldingly in either position, of a support for each of said series of sleeves upon which they can be rotated,

a candidate key for each of said sleeves cooperating therewith to rotate it in alternate directions as it is moved to and from its operated position, and stops for the end sleeves of the series.

13. In a device of the class described, the combination with the plural office series of interlocking sleeves having the cam ends, constituting the primary interlocking mechanism, of a support for each of said sleeves upon which they can be rotated, a candidate key for each of said sleeves coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position, connections between the key and the sleeve permitting the longitudinal movement of the latter, and secondary interlocking mechanism coöperating with said primary series to limit the number of keys that can be operated in the entire series.

14. In a device of the class described, the combination with the plural office series of interlocking sleeves having the cam ends constituting the primary interlocking mechanism, of a support for each of said sleeves upon which they can be rotated, a candidate key for each of said sleeves coöperating therewith to rotate it in alternate directions as it is moved to and from its operative position, connections between the key and the sleeve permitting the longitudinal movement of the latter, secondary interlocking mechanism coöperating with said primary series to limit the number of keys that can be operated in the entire series, and means for grouping the elements of the secondary interlocking mechanism as may be desired for single-candidate and multi-candidate-to-be-elected groups.

15. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group, adapted to be affected by the operation of the keys proportionately to the number that are moved to operative position, secondary interlocking mechanism cooperating with said primary interlocking mechanism, and comprising a sleeve having a cam end for each group of primary mechanism, and connections between the sleeve and the associated primary interlocking mechanism whereby the sleeve will be rotated proportionately to the number of keys operated in its group.

16. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group, adapted to be affected by the operation of the keys proportionately to the number that are moved to operative position, secondary interlocking mechanism cooperating with said primary interlocking mechanism, and comprising a sleeve having a cam end for each group of primary mechanism, connections between the sleeve and the associated primary interlocking mechanism, whereby the sleeve will be rotated proportionately to the number of keys operated in its group, and stops for the end sleeves of the group.

17. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group, adapted to be affected by the operation of the keys proportionately to the number that are moved to operative position, secondary interlocking mechanism cooperating with said primary interlocking mechanism, and comprising a sleeve having a cam end for each group of primary mechanism, connections between the sleeve and the associated primary interlocking mechanism, whereby the sleeve will be rotated proportionately to the number of keys operated in its group, and means for temporarily securing any sleeve in the position to which it will be moved by the actuation of one key in its group.

18. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group, adapted to be affected by the operation of the keys proportionately to the number that are moved to operative position, secondary interlocking mechanism cooperating with said primary interlocking mechanism, and comprising an element having a cam end for each group of primary mechanism, and connections between the element and the associated primary interlocking mechanism, whereby the element will be rotated proportionately to the number of keys operated in its group, the alternate elements being rotated in opposite directions.

19. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group, adapted to be affected by the operation of the keys proportionately to the number that are moved to operative position, secondary interlocking mechanism cooperating with said primary interlocking mechanism, and comprising an element having a cam end for each group of primary mechanism, connections between the element and the associated primary interlocking mechanism, whereby the element will be rotated proportionately to the number of keys operated in its group, the alternate elements being rotated in opposite directions, and stops for the end elements of the group.

20. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group, adapted to be affected by the operations of the keys proportionately to the number that are moved to operative po-

sition, secondary interlocking mechanism cooperating with said primary interlocking mechanism, and comprising a sleeve having a cam end for each group of primary mechanism, and connections between the sleeve and the associated primary interlocking mechanism, whereby the sleeve will be rotated proportionately to the number of keys operated in its group, consisting of the rack bar moved by the primary interlocking mechanism and having its teeth extending across its wide face and coöperating with a peripheral row of teeth on the sleeve.

21. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group adapted to be affected by the operation of the keys proportionately to the number that are moved to operative position, and secondary interlocking mechanism coöperating with said primary interlocking mechanism, and comprising an element having a cam end for each group of primary mechanism, said sleeve being designed so that it can be turned end for end and so that the alternate elements will be rotated in the opposite direction, and connections between each element and the associated primary interlocking mechanism, whereby the element will be rotated proportionately to the number of keys operated in its group.

22. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group, adapted to be affected by the operation of the keys proportionately to the number that are moved to operative position, and secondary interlocking mechanism coöperating with said primary interlocking mechanism, and comprising a sleeve having a cam end for each group of primary mechanism, said sleeve being designed so that it can be turned end for end so that the alternate sleeves will be rotated in the opposite direction, and connections between each sleeve and the associated primary interlocking mechanism, whereby the sleeve will be rotated proportionately to the number of keys operated in its group, consisting of the rack bar moved by the primary interlocking mechanism, and having the teeth extending across its wide face and engaging a peripheral row of teeth on the sleeve.

23. In a device of the class described, the combination with the office groups of keys, of the primary interlocking mechanism for each group, adapted to be affected by the operation of the keys proportionately to the number that are moved to operative position, and secondary interlocking mechanism coöperating with said primary interlocking mechanism and comprising a sleeve having a cam end for each group of primary mechanism, said sleeve being designed so that it can be turned end for end so that the alternate sleeves will be rotated in the opposite direction, and connections between each sleeve and the associated primary interlocking mechanism whereby the sleeve will be rotated proportionately to the number of keys operated in its group, consisting of the rack bar moved by the primary interlocking mechanism, and having the teeth extending across its wide face and meshing with the peripheral row of teeth on the sleeve.

24. In a voting machine, the combination with the swinging key, of the interlocking element movable along the axis of the key, and connections between the key and interlocking element which compel the interlocking element to swing with the key while permitting its relative movement along the axis.

25. In a voting machine, the combination with the plurality of swinging keys in alinement, of the interlocking elements having the abutting cam ends and movable along the axis of the keys, and connections between the keys and their respective interlocking elements which permit the interlocking elements to swing with the keys while permitting their relative movement along said axis.

26. In a voting machine, the combination with the plurality of swinging keys arranged in alinement, the alternate keys being adapted to swing in opposite directions, of the corresponding plurality of interlocking elements movable along the axis of the keys and having the abutting cam ends, and connections between the keys and interlocking elements which compel the interlocking elements to swing with the keys while permitting their relative movement along the axis.

27. In a voting machine the combination with the plurality of swinging keys, of the corresponding plurality of interlocking elements movable along the axis of the keys and having the abutting cam ends, connections between the keys and interlocking elements which compel the interlocking elements to swing with the keys while permitting their relative movement along said axis, and means to limit the amount the interlocking elements may be extended.

28. In a voting machine, the combination with the swinging key, of the sleeve with the cam ends having the elongated slot passing through the key, and the spline in the key extending into the slot.

29. In a voting machine, the combination with the swinging key, of the bar coöperating therewith, and connections between the key and bar, consisting of the slot in the bar and the portion of the key having the curved edges coöperating with the ends of the slot.

30. In a voting machine, the combination with the series of swinging party-candidate

keys, of the bar having the slots therein longer than the width of the portion of the key passing therethrough, means for moving said bar in one direction to move the keys for a straight-ticket vote, and means for moving it in the opposite direction to reset the keys.

In witness whereof, I have hereunto set my hand and affixed my seal, this 27th day of April, A. D. 1908.

JOHN HOWARD McELROY. [L. s.]

Witnesses:
JNO. H. NELSON, Jr.,
U. P. KILROY.