

3 SHEETS—SHEET 1.

John Howard McElroy.

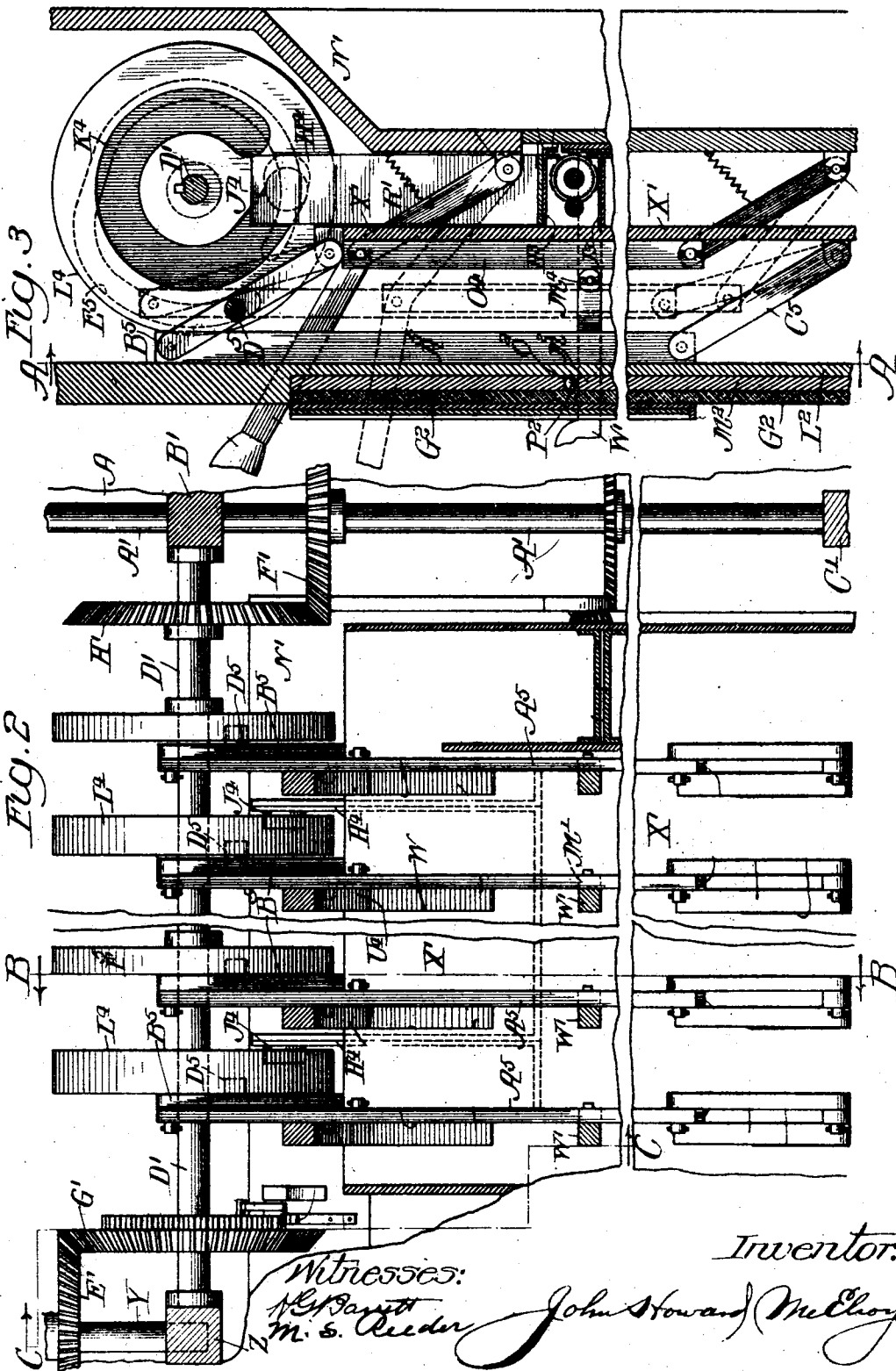
J. H. McELROY.
INTERLOCKING MECHANISM FOR VOTING MACHINES.

APPLICATION FILED JAN. 22, 1906.

Patented Nov. 30, 1909.

3 SHEETS—SHEET 2.

941,801.



Witnesses:

M. S. Reader

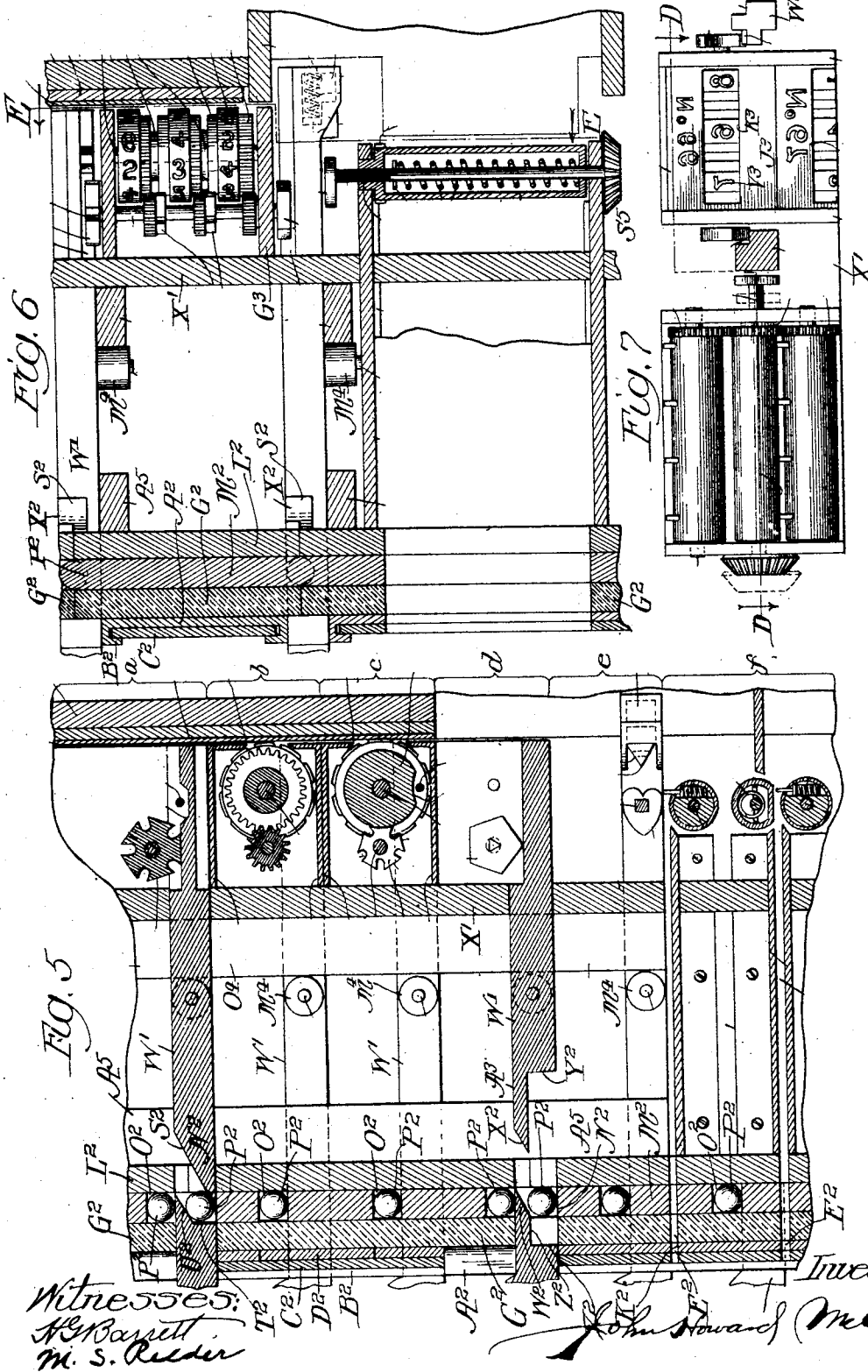
Inventor:

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UNITED STATES PATENT OFFICE.

JOHN HOWARD McELROY, OF CHICAGO, ILLINOIS.

INTERLOCKING MECHANISM FOR VOTING-MACHINES.

941,801.

Specification of Letters Patent.

Patented Nov. 30, 1909.

Original application filed March 12, 1900, Serial No. 8,568. Divided and this application filed January 22, 1906. Serial No. 297,134.

To all whom it may concern:

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

My present application is a division of my application No. 8,568, filed March 12, 1900, and is designed to cover the interlocking mechanism shown in the aforesaid application.

As interlocking mechanisms have been mainly constructed heretofore, they have consisted of movable balls, blocks, and similar solid members, suitably confined in channels or ways, and adapted to be separated by the entrance of an enlargement of some member already in the channel, or by the entrance of a member not previously in the channel, the said member being connected to the operating key, and the purpose being to limit the possible space in the channel or way, so that after the required number of keys have been operated, there would be no more space in the channel unoccupied, so that no further operation of the keys would be possible. This construction adapts itself readily to offices where only a single candidate is to be elected; but for what are known as multi-candidate groups, where a large number of keys must be operated in the same group, it becomes difficult to arrange a practical device operating upon this principle.

In my improved construction, instead of having the key, or any part positively attached to it, occupy the space in the channel or way, I have arranged a ball or block in connection with an aperture outside of the channel, so that the operation of the key will force the block or ball from the aperture and into the channel, and the key occupies the aperture, leaving the channel entirely unobstructed by anything except the balls or blocks themselves, which can move freely to any part of the channel, and thus readily accommodate themselves to any possible arrangement of a group of operated multi-candidate keys, which accommodation does not and can not occur with the above-mentioned construction, wherein the member attached to the key enters into the channel and blocks it.

To illustrate my invention in one specific form, I annex hereto three 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 key-board of a voting machine with my invention applied thereto, parts of the figure being in section on different vertical lines to more clearly disclose the construction; Fig. 2 is a front elevation, with the parts in section on the line A—A of Fig. 3; Fig. 3 is a side elevation, in section on the line B—B of Fig. 2; Fig. 4 is a side elevation in section on the line C—C of Fig. 2; Fig. 5 is a vertical section through the machine on certain section lines, as will be fully explained hereinafter; Fig. 6 is a plan view in section on the line D—D of Fig. 7; and Fig. 7 is a rear elevation of a portion of the mechanism in section on the line E—E of Fig. 6. In the above drawings, Figs. 1 to 4 are on one scale, and Figs. 5 to 7 are on another and larger scale.

Referring now specifically to Figs. 2, 3 and 4, I may state that the mechanism for resetting and operating the machine may be of any desired character, as it forms no part of my present invention, but I have shown for this purpose the sprocket wheel O secured to the upper end of the vertical shaft Y, which is mounted in suitable bearings in the machine, the upper bearing being conveniently formed by an aperture in the top of the casing, while the lower bearing is formed in the cross piece Z, which extends from the front to the rear of the machine. Another similar sprocket wheel (not shown) is likewise rigidly secured to the upper end of the vertical shaft A', which, however, instead of terminating in a bearing in the cross piece B', corresponding to the cross piece Z, extends through said cross piece B' and down to a bearing formed in the cross piece C' at the bottom of the machine. The cross pieces Z and B' are provided with bearings therein for the ends of the horizontal shaft D', which is geared to the shafts Y and A' by means of the beveled gear wheels E' on the shaft Y, F' on the shaft A', and G' and H' on the shaft D'. The distance that the chain or other operating mechanism co-operating with the sprocket wheel O' is moved in fully opening the booth, the

size of the sprocket wheels, and the relative proportions of the beveled gear wheels E' and F' to their cooperating gear wheels G' and H' are such that the shaft D' is given a forward rotation through an angle of about 315° as the booth is opened, and returned through the same angle as the booth is closed.

Before entering into a further description of the mechanism and connections operated by the shaft D', I desire to explain in detail the construction of the keys and their interlocking mechanism, with which the present application is concerned. Each key W' extends substantially from the rear of the casing to and through the front of the casing, being supported by the vertical partition X', as well as by the front side or face of the machine, which may be made up of the different parts to be described. The key W' is of a generally rectangular shape, with the exceptions hereinafter described, and is provided with the hook Y', at its outer end, as the keys are constructed to be drawn out as they are operated, and the hook Y' facilitates grasping them for this movement. These keys are constructed to slide freely back and forth in the front wall of the casing, which is made up of the parts hereinafter described, and in the partition X', which extends vertically through a portion of the machine parallel to the front and rear walls, in the position shown in the various figures.

The front wall is preferably composed of three distinct layers, which may be employed in building up the mechanical structure, together with an outer part or layer that serves to hold the ballots. The outermost layer A², as shown in elevation in the lower part of Fig. 1, and in section in Figs. 4, 5 and 6, consists primarily of a metallic strip fastened to the various layers composing the front wall, which are all conveniently bolted together, and has its edges turned over as at B² so as to form a channel in which the ballot strip C² can be conveniently placed and retained. For the purpose of conveniently viewing the interlocking mechanism at all points when the ballot strips are removed, I may cut away parts of the body portion of this strip A², as at D², in Fig. 1, so that the interlocking mechanism may be readily visible for the purpose of noting its adjustment and action in overhauling the machine preparatory to an election. These strips A², as will be seen from Fig. 1, extend vertically between the rows of keys, filling up all of the available space. To make the parts of the machine beyond these vertical strips A² substantially flush therewith, I preferably fill out the remainder of the ballot board with the strips F², which may be of any desired material.

The next layer or part G² of the front

wall I preferably form of strips of glass, in order to facilitate the inspection of the parts in noting the operation of the interlocking mechanism, although it will be understood that other material might be employed. These strips G² are placed lengthwise in a vertical position, and consist of elongated rectangles, except that the sides have notches cut therein, so that when the adjacent strips are placed together the notches form an aperture of the shape which is necessary to cooperate with the keys sliding therethrough. On the left-hand side of each plate, except the left-hand one, the rectangular notches H² are employed, which are of the necessary size and shape to accommodate the right-hand two-thirds of one of the keys W'. On the opposite side of each of the plates is the aperture J², which is square, and which is one-sixth the area of the aperture H², and whose upper edge is flush with the upper edge of the aperture H². It will be seen that these notches together serve to form an aperture which is of the same cross section as is the key W' at the point where it passes through said plate G². When these plates G² are assembled, the surface thus formed is continuous except for the apertures through which the keys pass, and the elongated apertures K², which may be disregarded, as they pertain to the irregular balloting mechanism, with which this application is not concerned.

The rear plate L² of the front wall is preferably formed of metallic strips corresponding in every respect to the strips G². Of course, it will be understood that the rear plate L² might be continuous, and the apertures therein cut or punched out, but I prefer the built-up construction as being somewhat easier to manufacture.

The intermediate layer between the strips G² and L² is made up of a series of strips M², preferably metallic, and resembling in their general contour the strips G² and L², except that they are placed horizontally instead of vertically, and the notches N² therein, through which the keys W' pass, are square, these notches being arranged in the upper edge of the plates in position to register exactly with the apertures formed by the notches J² and H² in the plate G², and the corresponding notches in the plates L². These plates M², which are represented in Fig. 1 as showing through the glass plates G², do not abut against each other, but are separated by a sufficient space so that a horizontal channel O², which is preferably square in cross section, is formed between each pair of plates. For the single candidate rows, such as the upper three rows of Fig. 1, I fill these channels O² with a series of pieces P², which are preferably metallic spheres, like the ordinary balls for ball bearings, although it will be understood that

I might substitute short cylindrical rollers, or even sliding blocks. At the ends of each of these single-candidate channels, I insert the small coiled springs Q^2 , and the length
 5 of the channel and the number of balls therein is regulated by the strips or blocks R^2 , which are placed in the ends of the channel so as to close it. It will be understood
 10 that the number of balls in the channel is so regulated relative to the length of the channel and the size of the springs Q^2 , that when the springs Q^2 are expanded the channel is completely filled, but that an additional ball
 15 P^2 can be pressed upward between the adjacent balls, so that by compressing the springs Q^2 , one ball more, but not more than one, can be forced into the channel. For the purpose of forcing these balls into the channel, I make the key W' of a peculiar shape,
 20 best shown in Figs. 4 and 5, the key being so shaped that when it coöperates with the apertures through which it passes, it will serve, when it is in its innermost position, to receive one of the balls P^2 within the body of
 25 the key itself; and when the key is withdrawn, it will force the said ball upward out of the key, and into the channel O^2 . The key is preferably of such a shape that when it is pushed in to the limit of its movement, and also when it is drawn out to the limit of
 30 its movement, the upper side of the key will form a part of the bottom of the channel O^2 , so that the channel will be continuous and its bottom uniform, no matter which position the key is in, so that the balls can be
 35 moved freely past the keys, a condition which is necessary in connection with the multi-candidate groups, as will be explained farther on.

40 The key W' may conveniently be made of three vertical strips fastened together, each strip being of the same thickness and all of them having the same maximum width. While I have not shown the keys in the
 45 drawings as actually built up of these separate strips, I will suppose that they are for the purposes of description, as it will somewhat facilitate it. The right-hand strip, so far as the part of the key normally extending
 50 from the partition X' to the hook Y' is concerned, is of maximum width throughout. The intermediate strip, throughout the same portion of its length, as will be seen in the upper key shown in section in Fig. 5,
 55 is of the same uniform maximum width, except that it has parts of it cut away, so as to form an incline S^2 , an abutment T^2 , and an overhanging ledge or projection U^2 . The left-hand strip, shown in the fourth key
 60 from the top of Fig. 5, has also a cut-away portion, which forms an abutment V^2 , an overhanging projection or ledge W^2 , corresponding to and forming a part of the ledge U^2 , a short incline X^2 , corresponding to and
 65 forming an auxiliary to the upper part of

the incline S^2 , and an abutment Y^2 . It will be seen that the portions of this left-hand strip between the abutment B^2 and the incline W^2 , and between the abutment Y^2 and the incline X^2 , form the short flanges Z^2 and
 70 A^2 projecting from the left-hand side of the intermediate portion of the key. The ball P^2 , as will be seen in the two sections of the key in Fig. 5, when it is within the key,
 75 rests in the opening formed by the apertures in the intermediate and left-hand portions of the key, and that when the key is withdrawn the incline S^2 will force the ball upward, between the balls immediately above it,
 80 as indicated in Fig. 1, and into the channel O^2 , thereby adding one more ball to the number in the channel. The incline S^2 coöperates with one-half of the ball being moved, while the portions of the walls or
 85 plates G^2 and L^2 directly beneath the flanges Z^2 and A^2 coöperate with the other half of the ball to prevent it from moving backward and forward with the key, and
 90 compelling it to be moved backward by the action of the incline S^2 . When the key is in its innermost position, the bottom of the channel is formed by the tops of the ledges U^2 and W^2 , and when the key has been
 95 drawn out, and the ball forced completely upward into the channel O^2 , the bottom of the channel at that point is formed by the top of the key just beyond the inclines X^2 and S^2 . When the key is returned, either
 100 by the voter or by the resetting mechanism to be subsequently described, as the aperture in the key passes beneath the channel, so as to make an opening in the bottom thereof, the ball above the channel will fall into the
 105 aperture and roll down into the pocket in the key.

For the purpose of multi-candidate groups, such as the six rows grouped together, as shown in Fig. 1, instead of having the springs Q^2 and the blocks R^2 , I arrange plates B^3 , C^3 and D^3 at the ends of
 110 and in the same plane as the plates M^2 , so as to form the semicircular connections E^3 between the channels O^2 . I preferably form these plates B^3 , C^3 and D^3 so that the channel will be continuous throughout, so that
 115 if it were desired, one ball could be pushed from any portion of the channel, all the way through and around to its original position. Where the number of rows is even, this is conveniently arranged by the use of
 120 the semicircular connections E^3 arranged alternately at either end, and the additional connection F^3 , which joins the outermost rows. If the number of rows actually employed is uneven, it will be preferable
 125 to employ an even number of channels, and not provide one of the channels with keys. In arranging a multi-candidate group such as shown, the number of keys to be operated is determined, and a ball is placed in
 130

each key. Sufficient balls to completely fill the channel are then placed therein, except that a number of balls, corresponding to the number of keys that are to be operated at one time, are then withdrawn. By this construction, it will be seen that when any key is operated, one ball will be added to the channel, which then remains in the same condition as before, with the balls free to be forced or moved therein in whatever way may be necessary to accommodate them to the further operation of any of the keys. It will be readily apparent that a plurality of keys in a multi-candidate group cannot be operated simultaneously, as is preferable for straight-ticket voting, as the balls between the adjacent keys would cause them to jam, and consequently the multi-candidate groups, if any are employed, must not be operated by the straight-ticket mechanism, but must be voted separately. It will be equally apparent that while two keys in the same horizontal row cannot be operated simultaneously, there is no occasion to do so, and any necessary number of keys can be operated in the same row one after another, which might be necessary if the voter should desire to cast a ballot for more than one man from each political party represented in the multi-candidate group. It will also be apparent that when the multi-candidate group has been fully operated, the continuous channel will be full of balls, so that if all the keys should be reset simultaneously, there would be a ball above every key ready to enter the key as it is withdrawn. It will, of course, be understood that the plates B³, C³ and D³ will be arranged in any desired shape and manner necessary to make the desired connections for the multi-candidate groups. By the construction thus employed, in which the operation of a key does not close the channel at all, but simply introduces an additional movable member therein, I have provided a construction of the utmost flexibility for a purely mechanical structure, and one that will be capable of adaptation to any kind of multi-candidate groups. As interlocking mechanisms of this general type have been employed previously, it has been difficult to arrange them so that there will be perfect freedom of action in all the peculiar combinations that may arise in multi-candidate voting.

In order to reset the keys, and insure a ball being over the key as it is reset, so that it will carry out a ball from the channel in its resetting movement, I provide the following resetting mechanism: Extending along one side of each vertical column of keys, as best shown in Figs. 2 and 3, is a bar A⁵, which normally rests against the rear side of the front wall of the casing, and is supported by the links B⁵ and C⁵, which

are pivoted on lugs projecting inwardly from the partition X', as clearly shown in Fig. 4. To move these bars A⁵ from front to rear, so that by coöperating with the anti-friction rollers M⁴ projecting from the sides of the keys in the same vertical plane as the adjacent bar A⁵, the keys will be returned to normal position, I secure an anti-friction roller or stud D⁵ upon the right-hand side of the link B⁵ and in position to project into the cam slot or groove E⁵ formed in the left-hand faces of the disks L⁴, and in the same faces of as many additional disks F⁵ secured upon the shaft D' as may be necessary for the number of vertical columns or registers employed. By an examination of the cam slot E⁵, shown in dotted lines in Fig. 7, it will be seen that shortly after the register frame has been raised by the action of the cam slots K⁴ in the right-hand faces of the disks L⁴ upon the anti-friction rollers J⁴ carried by the register supporting frame, the link B⁵ is drawn in rearward by the action of its cam slot E⁵, carrying with it the bar A⁵, which is compelled to move parallel to itself by reason of its connection to the link C⁵. In order to distribute somewhat uniformly over the entire resetting movement of the apparatus the work to be performed, I preferably place these cams E⁵ in different angular positions relative to the shaft D', as indicated by the dotted lines in Fig. 4, so that first one bar A⁵ will be operated, then the adjacent one, and so on until all of them have been operated. In addition to thus equalizing the power demanded throughout the operation of the machine, if a multi-candidate group has been badly scratched, I secure a successive operation in returning the different keys that does not require such a rapid adjustment of the balls to the requirements of resetting the device.

While I have herein shown and described my invention as embodied in the form which I at the time of the invention considered 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, in which is to be included the structures shown in applications of mine bearing an earlier filing date than March 12, 1900, the date of the original application, No. 8,568.

While I have herein shown and described to some extent certain inventions in voting machines not concerned with the interlocking mechanism, I do not herein claim the same, but reserve the subject-matter thereof for other applications.

While I have herein claimed the features of this invention as generically as possible, in view of what is shown in my prior appli-

cation No. 719,758, filed July 8, 1899, I have in the last-mentioned application, which discloses a different specific form, made generic claims designed to cover both specific forms.

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

1. In a voting machine, the combination with plural series of keys, of interlocking members detached therefrom but operating therewith to limit the number of keys that may be simultaneously operated, a resetting member for each series of keys, and means for operating said resetting members *seriatim* to return said keys.

15 2. In a voting machine, the combination with plural series of keys arranged in party rows, of interlocking members entirely detached therefrom but operating therewith to limit the number of keys that may be operated in any party group, a resetting member for each row, comprising a movable bar co-operating directly with said keys, and means for operating said bars *seriatim* to return said keys.

25 3. In a device of the class described, the combination with plural series of keys, of interlocking members entirely detached therefrom, but coöperating therewith to limit the number that may be simultaneously operated, a resetting member for each series, and means for operating said resetting members *seriatim* to return said keys, said means comprising a shaft having a number of cams arranged thereon in different angular positions, each cam being adapted to coöperate with the resetting member for one series.

30 4. In a device of the class described, the combination with a channel or way having a limited capacity, of a series of uniform interlocking members adapted to occupy and to be moved into and out of said channel, and a series of keys adapted to be moved from inoperative to operative positions and thereby force interlocking members into said channel additional to those therein when the keys are in inoperative position.

45 5. In a device of the class described, the combination with a channel or way having a limited capacity, of a series of uniform interlocking members adapted to occupy and to be moved into and out of said channel, and a series of keys adapted to be moved from inoperative to operative position and thereby force interlocking members into said channel, and also to be moved from operative to inoperative position and thereby withdraw the same number of interlocking members from said channel additional to those therein when the keys are in inoperative position.

60 6. In a device of the class described, the combination with a channel or way having a limited capacity, of a series of interlocking members adapted to occupy said channel, and a series of keys provided with re-

cesses adapted to contain a certain number of said members, and to be moved from inoperative to operative position and thereby force the members in said keys into said channel.

7. In a device of the class described, the combination with a channel or way having a limited capacity, of a series of interlocking members adapted to occupy said channel, and a series of keys each provided with a recess adapted to contain a certain number of said interlocking members and adapted to be moved from inoperative to operative position and thereby force the members in said recess into said channel, and to be moved from operative to inoperative position and thereby permit the withdrawal of the same number of said interlocking members from said channel into said recess.

8. In a device of the class described, the combination with a channel or way having a limited capacity, of a series of interlocking members adapted to occupy said channel, and a series of keys forming a part of the boundary of said channel in either their operative or inoperative position, said keys being adapted to be moved from inoperative to operative position and thereby force additional interlocking members into said channel.

9. In a device of the class described, the combination with a channel or way having a limited capacity, of a series of interlocking members adapted to occupy said channel, recesses in the framework adjacent to said channel also adapted to be occupied by the interlocking members, a series of keys co-operating with said recesses and having cam surfaces thereon adapted to force additional interlocking members from the recesses into said channel as the key is moved from inoperative to operative position.

10. In a device of the class described, the combination with a channel or way having a limited capacity, of a series of interlocking members adapted to occupy said channel, recesses in the frame work adjacent to said channel, keys coöperating with said recesses and having cam surfaces therein, and a co-operating recess in each of said keys, said recesses in the frame and keys coöperating to form a recess to receive an interlocking member which is forced from said recess into the channel when the key is moved from inoperative to operative position.

11. In a voting machine, the combination with a series of keys each provided with a recess, of a plurality of locking members having a bodily movement in a path longitudinal of and above the series, certain of said members having a bodily movement transversely of said path to enter the key recesses by gravity.

12. In a voting machine, the combination with a series of keys each provided with a

recess, of one or more members adjacent to the keys formed with a channel extending longitudinally of the series, the key recesses communicating with the channel in the normal position of the keys, locking members adapted to operate in the channel and recesses, and means for giving access to the channel whereby the number of locking members therein may be varied.

13. In a voting machine, the combination with a series of keys each provided with a recess and a cam face within said recess, of one or more members adjacent to the keys formed with a channel extending longitudinally of and above the series, the key recesses communicating with the channel in the normal position of the keys, and locking members adapted to operate in the channel and recesses and to be raised from said recesses by the cam faces when a key co-acting with a locking member is moved to its vote recording position.

14. In a voting machine, the combination with a key provided with a recess, of a spherical locking member adapted to be received by said recess.

15. In a voting machine, the combination with a plurality of keys each provided with a recess, of a casing adjacent to the keys provided with openings in its walls communicating with the recesses, locking members operating within the casing and recesses, and a removable section in the casing through which access may be had to the interior.

16. In a voting machine, a key arrester mechanism, consisting of a channel, a plurality of limiting devices therein, a pocket communicating with said channel and adapted to receive one of said limiting devices, and a vote indicating device adapted to move a limiting device from said pocket into the channel between said limiting devices therein.

17. In a voting machine, a race unit carrying balls and means for laterally removing the balls from the race.

18. In a voting machine, a race unit comprising a plurality of race sections arranged in parallel planes, and curved sections connecting said parallel race sections.

19. In a voting machine, an interlocking mechanism having two stationary sections lying in approximately parallel planes, the parallel sections being connected at one end by a curved third section, and all the sections communicating.

20. In a voting machine, an interlocking mechanism having movable parts and two stationary connected sections adapted to communicate by a similar section, two of the sections being situated in transverse planes including on the side toward the direction of the movement of the said parts an interior angle greater than a right angle.

21. In a voting machine, an interlocking

mechanism comprising a series of stationary sections, each having movable interlocking parts, the ends of each section being connected in pairs by other sections whereby they may communicate, said latter section being at alternate ends of the pairs of sections.

22. In a key arrester mechanism for voting machines, the combination with a series of keys, a beveled surface on each key extending in one direction only, a frame through which the keys pass, having a channel therein, and movable devices in said channel adapted to be moved in the aggregate by the beveled surfaces on the keys the distance of one device and prevent the operation of more than a determined number of said keys.

23. In a key arrester mechanism for voting machines, the combination with a series of keys, a beveled surface on each key extending in one direction only, a frame through which all of said keys pass, a series of balls or rollers located in a continuous channel in said frame, and in the path of the beveled surfaces on the keys to be moved thereby in the aggregate a distance of one ball or roller and block the movement of other keys.

24. In a key arrester mechanism for voting machines, the combination with a series of keys, a beveled surface on each key extending in one direction only, a frame through which the keys pass, said frame having a channel therein for balls or rollers, balls or rollers in said channel filling the same with the exception of the size of a predetermined number of balls or rollers, and the inward movement of each of the key beveled surfaces being just sufficient to move the aggregate number of balls or rollers a distance of one ball or roller.

25. In a key arrester mechanism for voting machines, the combination with a series of keys, a beveled surface on each key extending in one direction only, a frame through which the keys pass, said frame having channels therein for balls or rollers, balls or rollers in said channels filling the same with the exception of a space or size of a predetermined number of balls or rollers, and the inward movement of a key beveled surface being just sufficient to move the balls or rollers a distance of one ball or roller, and means for connecting several of said channels, compelling the coöperation of the balls or rollers in all of said channels so connected.

26. In a key arrester mechanism for voting machines, the combination with a series of keys, a beveled surface on each and every key extending in one direction only, a frame through which the keys pass, said frame having a channel therein for balls or rollers and chutes connecting the channel

with the key passage ways, balls or rollers in said channel and chutes filling the same with the exception of a space equal to a predetermined number of balls or rollers, and said
5 key beveled surfaces being adapted when moved to operative position to displace the balls or rollers a distance of one ball or roller.

27. In a key arrester mechanism for voting
10 ing machines, the combination with a frame having a series of channels open at one end and a grouping block connecting said channels, of balls or rollers in said channels,
15 said channel, keys passing through the frame, and adapted to move the balls into and out of the channels, and beveled surfaces on said keys of just the proper size to displace the balls or rollers a distance of one
20 ball or roller.

28. In a blocking apparatus for voting machines, the combination with a frame having a series of channels open at both ends and movable grouping blocks having grooves therein to connect said channels when in
25 alinement therewith, of balls or rollers in said channels, fewer than the number required to fill said channel, keys passing through the frame and adapted to move the balls into and out of the channels, and beveled
30 surfaces on said keys of just the proper size to displace the balls or rollers a distance of one ball or roller.

In witness whereof, I have hereunto set my hand this 22nd day of May, 1905.

JOHN HOWARD McELROY.

Witnesses:

JULIA M. BRISTOL,
M. S. REEDER.