

C. C. ABBOTT.
 GROUPING MECHANISM FOR VOTING MACHINES.
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2 SHEETS—SHEET 2.

Fig. 3.

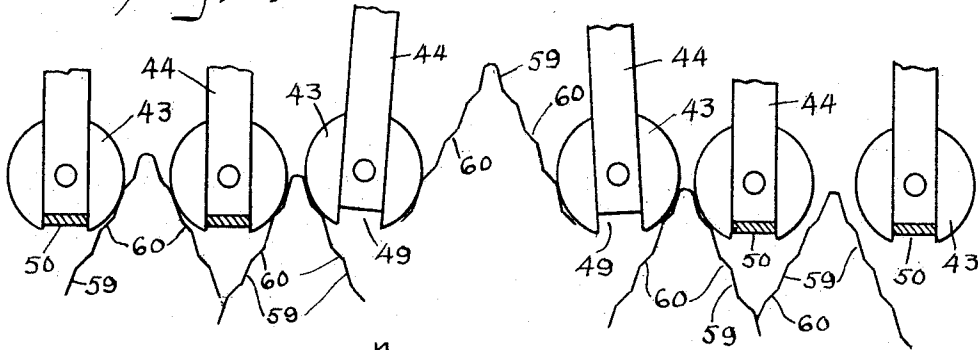


Fig. 4.

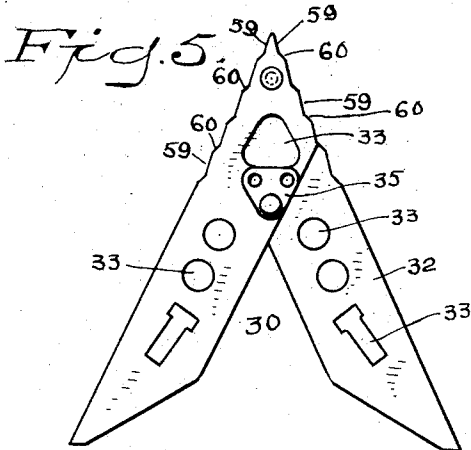
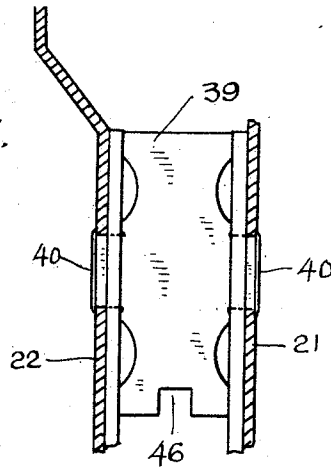
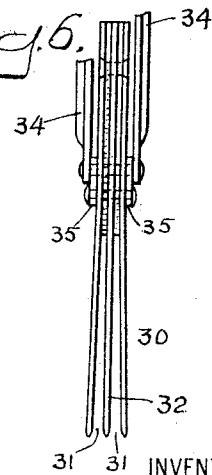


Fig. 6.



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GROUPING MECHANISM FOR VOTING-MACHINES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES C. ABBOTT, a citizen of the United States, residing at Pittsfield, county of Berkshire, State of Massachusetts, have invented an Improvement in Grouping Mechanism for Voting-Machines, of which the following is a specification.

This invention relates to that portion of the mechanism of a voting machine which has to do with group voting, so called, and the mechanism of my present structure is an improvement upon the mechanism of my former Patent Number 914,008, dated March 2, 1909.

The invention is shown as applied to a horizontal Triumph voting machine in which the names of party candidates are placed in horizontal lines and the names of all candidates for the same office are placed in vertical columns. It is, however, equally applicable to machines in which the names of candidates are placed alphabetically, as under the Massachusetts law.

As in my former patent referred to, the present structure permits votes to be cast in a group in accordance with the will of the voter, all for the nominees of one party or for one nominee of several parties, or for any number of nominees of any party up to the total number of offices in the group, and furthermore renders it impossible for a voter to cast but one vote for any candidate or more votes than there are offices in the group.

The essential feature of the present invention consists in providing the swinging angular separators or wedges with angular notches whereby surfaces lying at different angles to the vertical plane are provided for engagement with the swinging spacing blocks, thereby reducing the strain on the points of anchorage and the stretch upon the interlocking members to the minimum, while on the other hand should an attempt be made to force an additional vote above the predetermined number, the strain will be resisted by the greater angles of the separators or wedges and much less strain will be placed upon the interlocking members and the points of anchorage than where straight-sided separators are used.

With these and other objects in view I have devised the novel improvements which

I will now describe, referring to the accompanying drawings forming a part of this specification and using reference characters to indicate the several parts.

Figure 1 is an elevation, as seen from the front of a voting machine, of so much of the grouping mechanism as is necessary to illustrate the present invention; Fig. 2 an elevation as seen from the left in Fig. 1, supporting parts of the machine being in section; Fig. 3 a diagrammatic view illustrating the operation of the invention, one of the separators having been raised as when three votes have been cast for candidates of three different parties all in one office column; Fig. 4 an enlarged detail view illustrating the attachment of the way plates to the front plate and the group housing; Fig. 5 an elevation of a separator or wedge detached; and Fig. 6 is an edge view of a separator or wedge and the links by which it is suspended.

20 denotes the base of a voting machine, 21 the front plate, 22 the group housing, 23 the grouping plate, 24 a voting member and 25 an interlocking member. The interlocking members correspond in number with the office columns of voting members and each interlocking member comprises side plates 26 and cam plates 27 movable obliquely relatively to the side plates. The cam plates in each interlocking member correspond in number with the voting members in the column. The voting members are journaled in the framework of the machine and each comprises a shaft 28 and a depressing arm 29.

It will of course be understood that so far as the present invention is concerned any type of voting members may be used, for example—push buttons. When a voting member of the type illustrated is operated, the depressing arm engages the corresponding cam plate of the interlocking member and displaces it laterally, the effect of which is to contract the interlocking member longitudinally, taking up the slack therein and making it rigid.

30 denotes the separators which are broadly wedge-shaped as in my former patent referred to. They are made interengaging by providing one side of each separator, in the present instance the left side, with a slot 31 which receives a central projection 32 on the contiguous separator. The sepa-

rators may be formed in any suitable manner as in a single piece, although I preferably form them from three corresponding plates, two of which face in one direction and one, the central plate, in the opposite direction. In practice the plates are spaced apart and the lower ends upon the double side are sprung outward slightly, as shown in Figs. 2 and 6, so that the slots will always receive the projections freely. The plates may be lightened by blanking out small pieces of metal therefrom, as at 33 in Fig. 5, most of which are utilized in the machine. The separators are suspended so as to swing freely by means of parallel links 34, four links being provided for each separator. The links are preferably ribbed to increase their rigidity and plates 35 are interposed between the links and the plates of the separators, plates 35 being riveted to the plates of the separators and the pivots passing through all of the parts, as clearly shown in Fig. 6. The upper ends of the links are pivoted to U-shaped carriers 36, as at 37. The carriers are adapted to slide vertically between way plates 38 which are secured to the front plate and the group housing by means of stay plates 39 provided with lugs 40 which pass through the way plates and the front plate and group housing respectively, and are headed down upon the outer sides of the front plate and group housing, as clearly shown in Figs. 2 and 4. These stay plates support the group housing and keep it perfectly rigid. The upper end of each carrier is connected to an interlocking member in any suitable manner as by means of a hook 41 extending from the carrier which engages a cross pin 42 extending between the lower ends of the side plates 26 of the corresponding interlocking member. 43 denotes spacing blocks, preferably circular in form, which are suspended so as to swing freely between the separators. Each spacing block is carried by an arm 44 which is pivoted on a cross pin 45 extending through the way plates and the front plate and group housing respectively. The cross pins lie just below the stay plates and the lower edges of the stay plates are provided with notches 46 to receive the upper ends of the arms. The distance from the centers of the pivots on which arms 44 swing to the centers of the spacing blocks is approximately the same as the distance from center to center of the pivots of links 34. This causes the separators and the spacing blocks to swing in arcs of approximately the same radius.

In order to insure the perfect alinement of the spacing blocks at all times I provide alining strips 47 on opposite sides of arms 44, said alining strips being carried by brackets 48. The arrangement of the alining strips with relation to the links and arms 44

will be readily understood from Fig. 2, the alining strips lying on opposite sides of the arms and between the arms and the pairs of links connected to opposite sides of the separators. As the links in each set (two pivoted to each side of each separator) cannot swing out of parallelism, it follows that the center lines of the separators must remain vertical under all the conditions of use and that the relative positions of the separators and spacing blocks are maintained in the swinging movements. The spacing blocks are rigidly secured to the arms, no adjustment of the blocks on the arms being required in the present structure, and each spacing block is provided in its under side with a transverse groove 49 which is adapted to receive a grouping key 50. These grouping keys are adapted to slide in slots 51 in the grouping plate, slots 52 in a guide flange 53 formed integral with the grouping plate, grooves 49 in the spacing blocks and their inner ends engage sockets 54 in one of the plates of the framework. The grouping keys are provided with lugs 55 which pass freely through clearance slots 56 which intersect with slots 52 in the guide flange and engage the inner side of the grouping plate to prevent detachment of the grouping keys from the machine. The guide flange is held rigid by means of sleeves 57 on rivets 58 which pass through the guide flange and the grouping plate and are headed down on the outer side of each.

In my former patent referred to, the sides of the separators are straight inclines. It will be obvious that when a group has been voted and strain is applied to a voting member to force an additional vote, a wedging strain will be applied to the corresponding separator which will be transmitted to the contiguous spacing blocks moving them laterally and the spacing blocks will transmit the pressure to the contiguous separators crowding them downward. This objection is practically overcome in my present structure and the strain upon the interlocking members and the points of anchorage is reduced to a safe minimum, and furthermore the possibility of forcing an additional vote after a group has been voted is practically eliminated. This I accomplish by providing the operative faces of the separators with straight-sided notches, the operative faces of which are indicated respectively by 59 and 60. Operative faces 59 lie at an acute angle to the vertical plane; for example, an angle of fifteen degrees to the vertical plane, making an included angle of thirty degrees. This acute angle of the upper operative faces is not an essential feature of construction as the separators would be operative if this face was in the vertical plane. By placing these faces at an acute angle to the vertical plane, however, I prevent the possibility of

the separators sticking in the raised position and insure that they will be forced downward to their normal position when released and a change in position of operated separators and spacing blocks takes place. Operative faces 60 of the separators lie at an obtuse angle to the vertical plane; for example, an angle of forty-five degrees to the vertical plane making an included angle of ninety degrees. The object of these obtuse-angled operative faces, which are brought into engagement with the contiguous spacing blocks by the operation of voting, is to provide such an angle of resistance to upward movement of the separators as to practically eliminate the wedging action and provide a solid wall of resistance to upward movement of the separators instead of a wedging action, so that the interlocking members remain perfectly rigid and practically no strain can be transmitted to the interlocking members or to the points of anchorage of the operative parts. Should an attempt be made to force a vote, all the strain will be taken up by the voting member to which no harm can be done unless sufficient power is applied to twist the shaft thereof, and in any event no harm can result to the internal mechanism of the machine.

In ordinary or regular voting, the spacing blocks are all locked against lateral movement by means of grouping keys, as clearly shown in Fig. 1, the separators hang suspended from the carriers by means of the links, and the carriers are connected to the lower ends of the interlocking members which hang straight down. It should be understood that each interlocking member has the capacity for as many slacks as there are cam plates in said member, and that in ordinary voting each interlocking member must be so set or adjusted as to permit the movement of one only of the cam plates. This adjustment of the interlocking members as set for ordinary voting I term the normal slack; in other words, this normal slack which is provided for in each interlocking member is just sufficient to permit the operation of one voting member. The operation of a voting member shortens the interlocking member and raises the corresponding separator by displacing a cam plate laterally. The upper ends of the separators lie intermediate the spacing blocks with a space normally between the separator and each spacing block. The aggregate of the two spaces is just sufficient to cause walls 59 and 60 of the separator to be lifted into close engagement with both spacing blocks by the operation of a voting member. In other words, just the amount of vertical movement of the separator is provided for that is required to permit the operation of a voting member, the effect of the operation of which is to take up the normal slack in

the interlocking member, shortening said member, drawing the separator into engagement with the spacing blocks and making the structure rigid.

The rule for setting up the machine for group voting is simply to withdraw all of the grouping keys from the spacing blocks intermediate the spacing blocks corresponding with the first and last office columns in a group; for example, in a group of two a single grouping key would be withdrawn, in a group of six the five intermediate grouping keys would be withdrawn and in a larger group the same rule would be carried out. It will be obvious that when the grouping keys of a group have been withdrawn, all the separators and spacing blocks intermediate the first and last spacing blocks of the group are free to swing laterally. While in ordinary voting the conditions require that one slack only be provided for in each interlocking member, *i. e.* the normal slack, and the operation of a single voting member takes up this normal slack, the conditions of group voting require that each interlocking member in the group have the capacity for the taking up in said member of a number of slacks equal to the number of offices to be voted for in the group, *i. e.* that every interlocking member in the group be so set or adjusted as to permit the operation in the corresponding office column of as many voting members as there are candidates to be voted for in the group or all the voting members in said office column if the number of candidates in the group equals or exceeds the number of voting members in an office column, and furthermore that the adjustment of the parts be such that the aggregate number of votes cast cannot exceed the number of candidates to be voted for in the group. This result is accomplished by means of the swinging separators and swinging spacing blocks. Starting with the principle that each interlocking member normally hangs loosely enough to just permit the taking up of one slack therein by the operation of a voting member, the unlocking of the spacing blocks intermediate the first and last spacing blocks in a group, *i. e.* the unlocking of one less spacing block than there are candidates to be voted for in the group, permits free transference of the entire number of slacks required for voting the group between the interlocking members in the group.

Having thus described my invention I claim:

1. In a voting machine, the combination with swinging spacing blocks, of vertically movable wedge-shaped separators provided with notches having operative faces lying at an acute angle to the vertical plane and other operative faces lying at an obtuse angle to the vertical plane.

2. A wedge-shaped separator of the character described having its operative faces provided with notches, each notch having a face lying at an acute angle to the vertical plane and a face lying at an obtuse angle to the vertical plane, substantially as described, 5 for the purpose specified.

3. In a voting machine, the combination with vertically-movable swinging separators, pairs of parallel links attached to the 10

opposite sides thereof, swinging spacing blocks and arms to which they are secured, of alining strips lying intermediate the pairs of links and on opposite sides of the arms.

In testimony whereof I affix my signature 15 in presence of two witnesses.

CHARLES C. ABBOTT.

Witnesses:

MALVINA B. DU FRESNE,
JOSEPH WARD LEWIS.