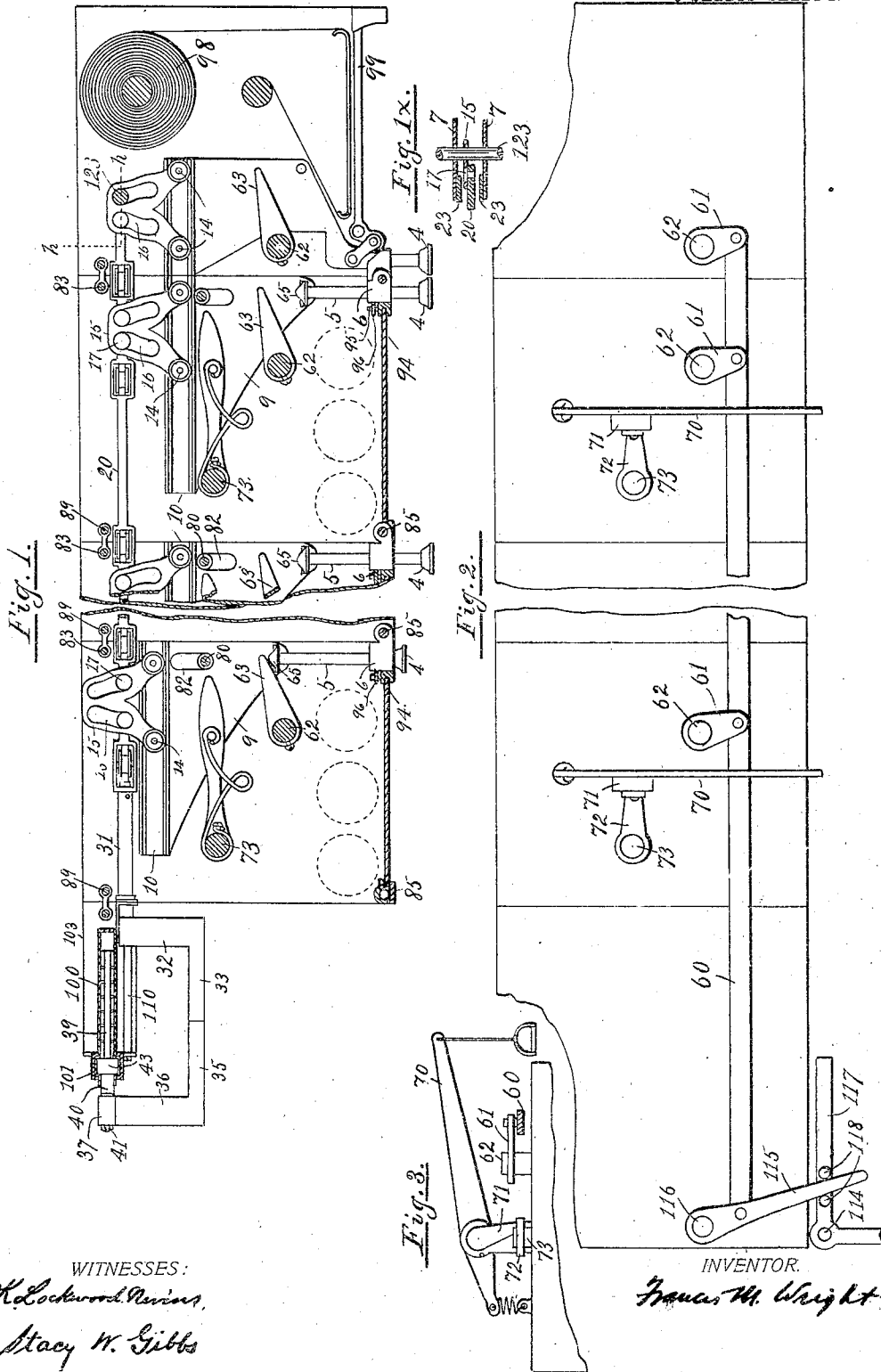


F. M. WRIGHT.
 INTERLOCKING MECHANISM FOR PARTY COLUMN VOTING MACHINES.
 APPLICATION FILED SEPT. 25, 1899.

1,032,526.

Patented July 16, 1912.

5 SHEETS-SHEET 1.



WITNESSES:
H. Lockwood Perkins,
Stacy W. Gibbs

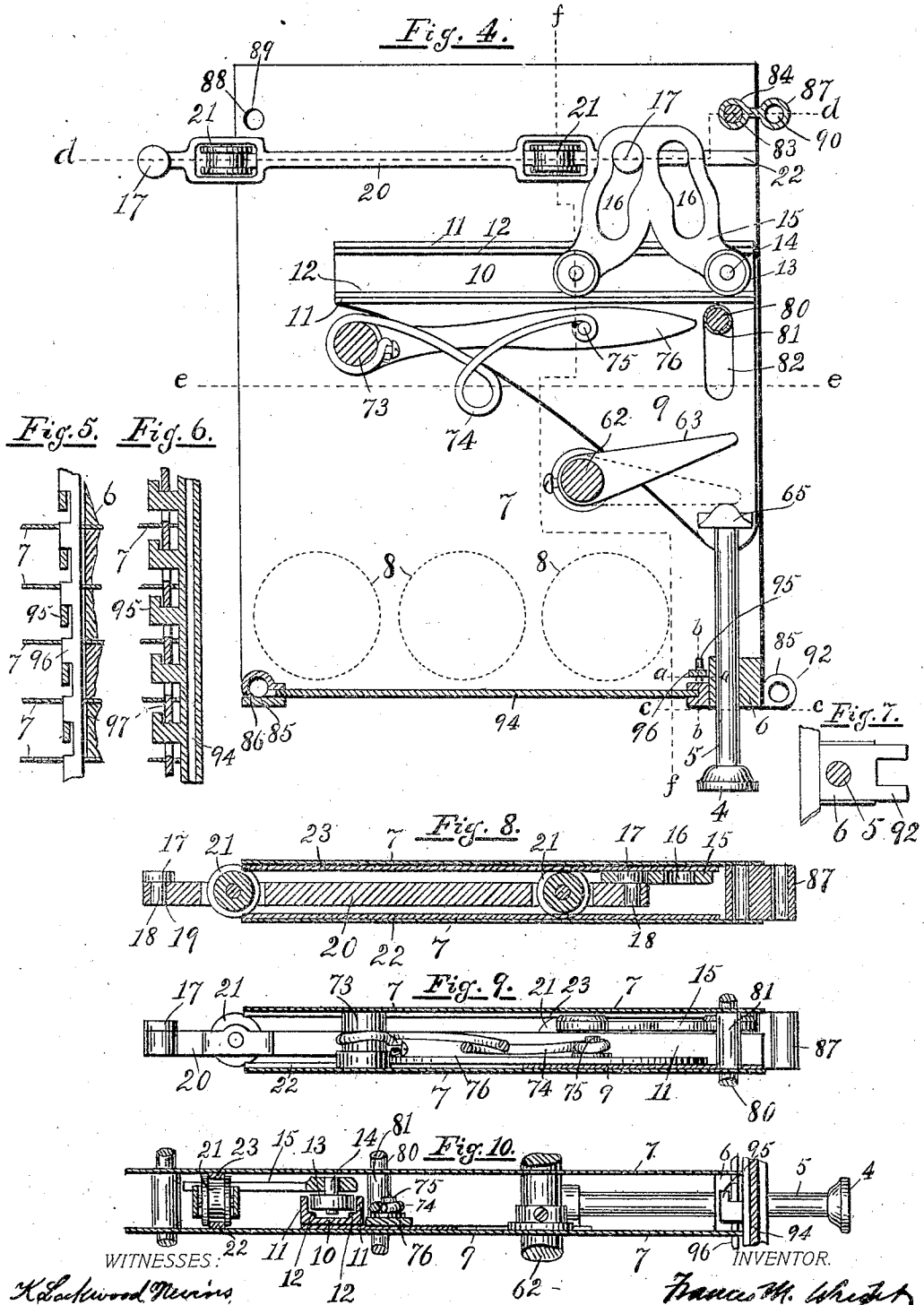
INVENTOR.
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5 SHEETS—SHEET 2.



WITNESSES:
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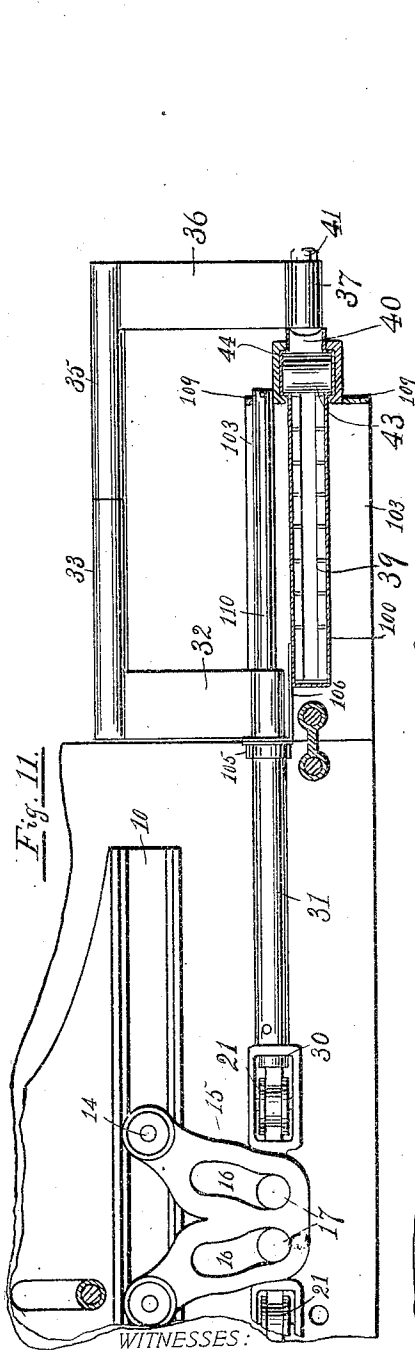
INVENTOR.
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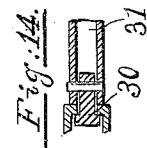
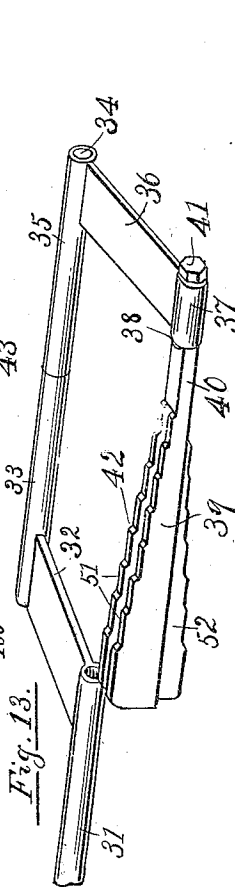
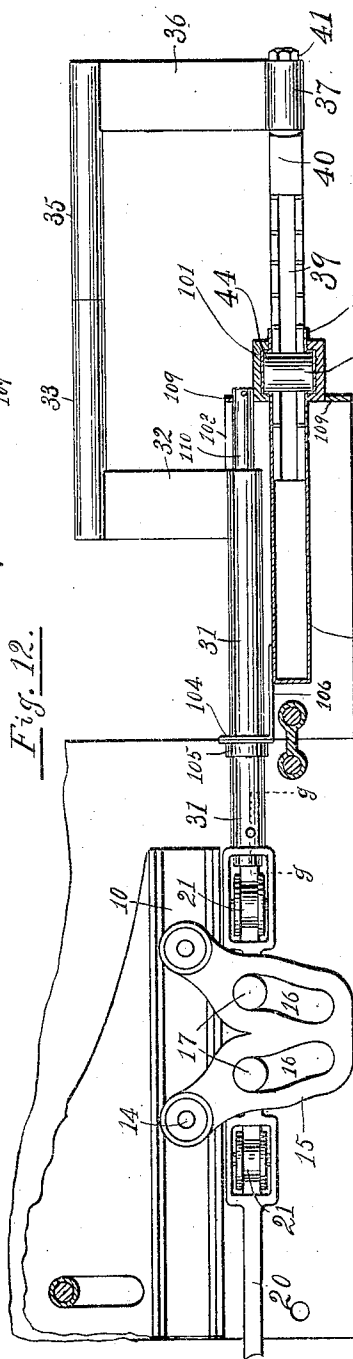
1,032,526.

Patented July 16, 1912.

5 SHEETS-SHEET 3.



WITNESSES:
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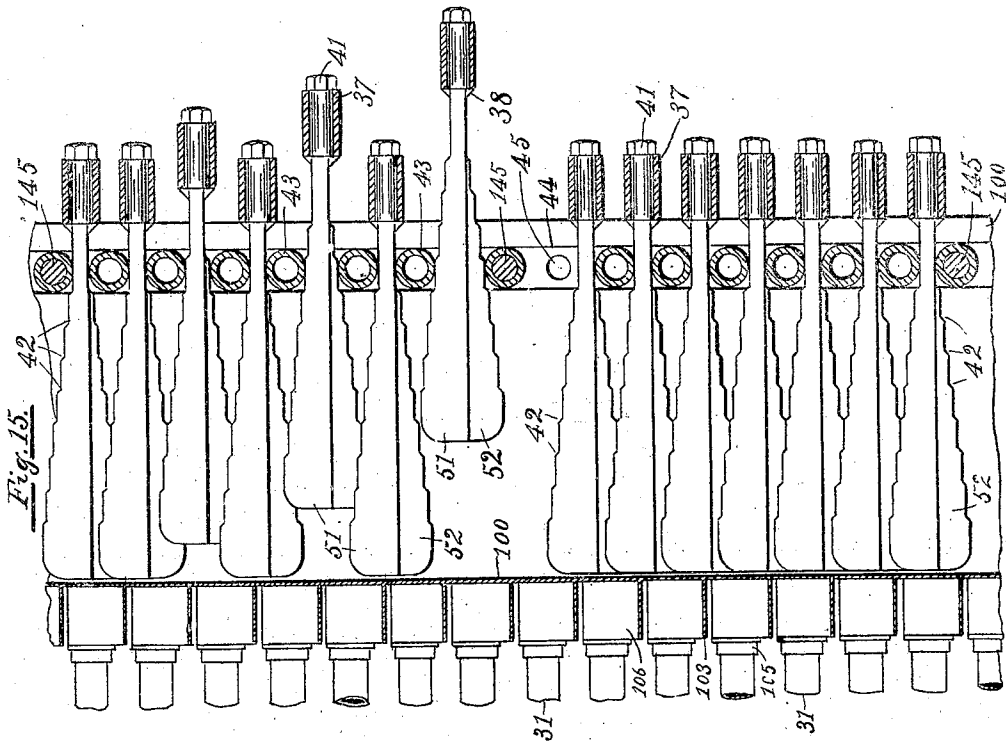
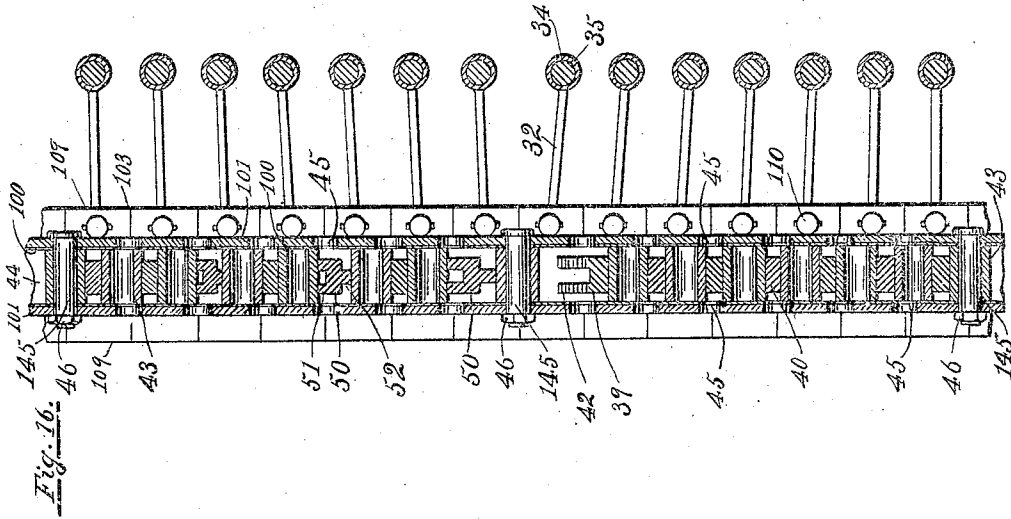
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1,032,526.

Patented July 16, 1912.

5 SHEETS—SHEET 4.



WITNESSES:

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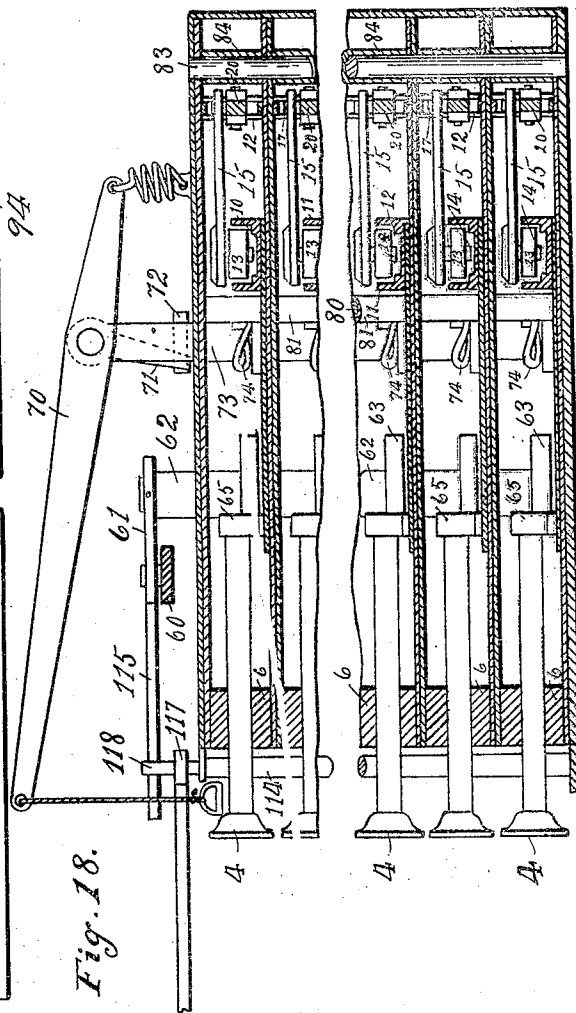
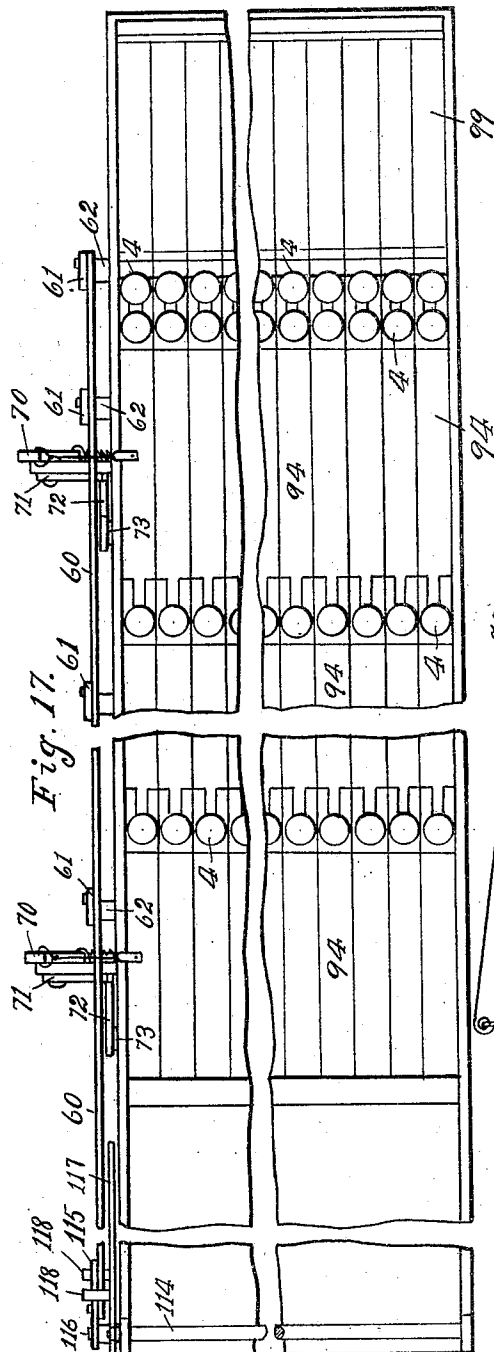
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Patented July 16, 1912.

5 SHEETS-SHEET 5

1,032,526.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANCIS M. WRIGHT, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO EMPIRE VOTING MACHINE COMPANY, OF JAMESTOWN, NEW YORK, A CORPORATION OF NEW YORK.

INTERLOCKING MECHANISM FOR PARTY-COLUMN-VOTING MACHINES.

1,032,526.

Specification of Letters Patent.

Patented July 16, 1912.

Application filed September 25, 1899. Serial No. 731,509.

To all whom it may concern:

Be it known that I, FRANCIS M. WRIGHT, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Interlocking Mechanism for Party-Column-Voting Machines, of which the following is a specification.

10 An important class of voting machines has the names of candidates of the respective parties arranged in vertical columns and for the respective offices in rows. For this class of machines it is necessary to
15 provide interlocking mechanism related to or actuated by each of the keys of a plurality of rows. Thus, if there are, say, ten such interrelated rows, and eight party columns, it must be possible to vote any ten keys
20 selected indiscriminately out of the eighty keys in the ten rows and eight columns and that then the remaining seventy keys shall be automatically locked.

The object of my invention is to provide
25 a mechanism of this character which shall permit of rapid adjustment of the machine for different elections; that is, so that the arrangement of the rows of keys for the various offices may be changed with facility
30 and without the necessary of removal of any of the parts and substitution of others of different dimensions. Further to provide an interlocking mechanism which will admit of a machine being increased or reduced in
35 size when desired by the inclusion or removal of one or more columns of keys to conform to variations in the number of party tickets, with slight extra expense for disassembling and re-assembling the machine.

40 A novel and important feature of my invention is that by my construction I am enabled to use rows and columns of voting keys with a space for the name of the candidate to be voted for at the side of each
45 key, which space shall be of considerable length in proportion to its height thereby enabling a voting machine to be constructed corresponding nearly in form and size with the ordinary form of ballot sheet in use
50 before the introduction of voting machines, which sheet contains the names of all candidates of the same party in single columns and the names of all candidates for the same

office in a row, the space devoted to each name being about three-eighths of an inch
55 high and from two to three inches long. This has been found the most convenient form of ballot sheet as it contains the names of the candidates in the most compact form and is the most convenient for the voter
60 as he can more readily follow the names of candidates of the same party.

It has not heretofore been practical so far as I am aware to provide a voting machine in which the names can be arranged
65 in spaces approximating in form and size to such ballot sheet, said spaces being close together, and the total space occupied, and the divisions thereof resembling in form and size those of the old style ballot sheet.
70 By the use of my invention this can be done.

My invention also resides in the novel construction, combination, and arrangement of the parts, hereinafter fully specified, and particularly pointed out in the claims.
75

In the accompanying drawings, Figure 1 is a horizontal section of the machine, an intermediate part being broken away; Fig. 1^x is a vertical section on the line 1^b—1^b of Fig. 1; Fig. 2 is a top plan view; Fig. 3 is
80 an end view, partly broken away, of the top of the machine; Fig. 4 is a plan view of one of the units, corresponding to a single key, of which the machine is built up, on an enlarged scale; parts not necessary to the com-
85 prehension of my invention being omitted; Figs. 5, 6, 7, 8, 9, 10, are vertical sections on the lines 5^a—5^a, 6^b—6^b, 7^c—7^c, 8^d—8^d, 9^e—9^e, 10^f—10^f, respectively, of Fig. 4; Fig. 11 is a horizontal section of the end of the
90 machine which contains the interlocking stops; Fig. 12 is a similar view showing a row, in which several of the keys have been operated; Fig. 13 is a perspective view of one of the stops and the swinging
95 connection to the train of carriages, detached from the roller channel; Fig. 14 is a vertical section through the pivotal connection 30; Fig. 15 is a vertical longitudinal section through the roller channel to illustrate the
100 cumulative locking of the keys; Fig. 16 is a vertical transverse section through the roller channel; Fig. 17 is a broken front elevation of a voting machine embodying my invention; Fig. 18 is a broken vertical cross
105 section of the same.

The arrangement shown is that common to machines of the class to which my invention relates, that is, the column on the left contains the list of offices to be filled or voted for, and the succeeding columns contain the names of nominated candidates for said offices arranged vertically in columns according to party. In addition to this a column on the right is devoted to the irregular or scattered vote.

In the columns for the names, on the right of each name, is a key 4, on the end of a push rod 5, (see Fig. 4) the pushing in of which key by the voter registers the vote, through any suitable mechanism, the mechanism of which need not be here specified, since my invention may be used indifferently with any counting or registering mechanism actuated by a longitudinal movement of a push rod, and such mechanisms are well known in the art, and form no part of my invention.

The push rod 5 has a bearing in a block 6, secured on the base plate 7 which carries the counting mechanism (indicated in dotted lines at 8), and the inner end of said push rod 5 is secured to a plate 9, which increases in width rearwardly and carries at its rear edge the transverse channel 10. Said channel is formed of two parallel vertical walls 11, said walls having, upon their inner or opposing faces, shoulders 12, upon which rest the extreme edges of two horizontal rollers 13, said shoulders being merely of sufficient height to raise the lower faces of said rollers 13 out of contact with the bottom of the channel 10. Said rollers are pivotally mounted on stud shafts 14 extending downwardly from a cam plate 15, and the rims of said rollers run against the inner faces of the walls 11. The diameter of said rollers is, however, slightly less than the distance between said walls, so that either of said rollers, when bearing against either of said inner faces, is out of contact with the other inner face. Thus the cam plate can move easily and without friction transversely of the machine, along the channel 10.

The cam plate 15 has, in its rear portion, two cam slots 16, in which work the heads 17 of pins 18, each pin having a vertical bearing in a hole 19 in the end of a link 20. Each link is mounted on two grooved wheels 21, the grooves of which engage track rails 22, 23, the lower rail 22 being secured on the top of the base plate 7, and the upper rail 23 being secured on the under side of the base plate 7 next above it. By means of the engagement with these rails of the grooves of the wheels 21, it is impossible for said wheels and links to move except in a transverse direction.

The cam slots 16 diverge from each other from the rear to the front. Thus when the

key 4 is pushed in, the cam plate, with its slots, having a like rearward movement, will cause the links on each side of it to separate a distance equal to the increased distance between the front end of the slots over that between the rear ends thereof. Every key in this machine has this same apparatus or plate 9, cam plate 15, and one link 20, but the cam plate 15 of each key is connected not only with its own link 20, but with the front or left hand end of the link 20 belonging to the next succeeding key, (from left to right), every link (except those in the first column) having a hole in each of its ends and carrying in each of said holes one of the pins 18. If now all the keys in the same row are connected through the cam plates 15 and links 20, and if all the links on both sides of their cam plates are equally free to move, then the effect of pushing in one of the keys of the row will be to move all the links on the right of said key slightly to the right, and the links on the left of said key slightly to the left, the distance moved being the transverse shift of either cam slot 16. The extreme right hand end of the line of links is, however, fixed to its plate 7 by a vertical rod 123 passing through all the holes at said extreme end and through holes in the plates 7 at said end, as shown in Fig. 1, and the result is that none of the links to the right of any key which is pushed in move at all, but the links to the left receive a double transverse movement, that due to the transverse shift of both the slots in the cam plate actuated.

When any link is shifted transversely, it carries with it its cam plate 15, whose rollers move freely along its channel 10, preventing binding of the cam plate 15 in its transverse movement across its plate 9. It is evident that the movement of any link due to the pushing in of its key, or of any key behind it, will be the same, however far the corresponding cam plate 15 may have been previously moved transversely along the channel 9, due to previous operations by the voter of keys in the same horizontal row. And the transverse movement due to the pushing in of each key is transmitted to the front end of the train of links, and is added to that due to the pushing in of the other keys at the left hand of each row as shown in Fig. 1. The first link of the train of links in each row has the hole 19 to receive one of the pins 18 only in its right hand end, its left end having an axial pivotal connection 30, as shown in detail in Fig. 14, with a tube 31 carrying a crank arm 32 from the outer end of which extends, in a direction parallel to the tube 31, a tube 33. A long pivot pin 34 connects said tube 33 with a similar tube 35 likewise connected by a crank arm 36 with a short tube 37. Said tube 37 forms a bearing for the end of a

stop block 39. The neck 40 of said block 39 has a shoulder 38 bearing against one end of said tube 37, and its pin carries a nut 41 bearing against the other end of said tube. Thus any movement, in either direction of its reciprocation, of any of the links 20 of a row, will, through the medium of the tubes 31, 33, 35, 37, and swinging cranks 32, 36 impart an equal longitudinal movement to the block 39. At the same time this construction permits the block to have a free vertical movement above or below the plane of movement to which the line of links 20 is restricted, the limit of said vertical movement being somewhat less than the sum of the lengths of the arms 32, 36. The block 39 has a series of steps 42 spaced at a distance equal to the transverse shift of the links due to the pushing in of one key, and stop blocks 39, by reason of said steps, gradually increasing in thickness. The necks 40 of said blocks normally rest between rollers 43 moving in a vertical channel 44, and to limit the amount of said movement certain of the rollers are fixed in position by means of bolts 145 passed through the rollers, which are hollow and through holes 45 in the opposite vertical walls of the channel, and there secured by nuts 46. The vertical channel is thus divided into compartments corresponding to the offices to be filled. The centers of the holes 45 in said vertical walls are spaced apart the distance from center to center of keys measured vertically, so that changes can easily be made in the machine to suit different elections.

It is desirable that the vertical space between keys should be as small as will permit of convenient manipulation of the keys, say, one half inch from key to key. If there are seven party columns and one column for the scattering votes each office line will have eight keys therein, and each stop block 39 must have eight steps. If a thickness of the neck of the stop block sufficient for strength be allowed, the height of each step would then be possibly smaller than would be desirable so as to safely permit a sufficiently loose fit of the rollers and wedges or stop blocks in the vertical channel 44 when they fill any compartment thereof. The height of each step may be greatly increased without increasing the distance between keys by constructing each stop block with a central plate 50, from which rise two stepped side fins 51 and depends one stepped central fin 52. The central fin of each block slides between the side fins of the block next below it. But when the block is pushed in between the rollers, both the upper and lower fins tend to spread the rollers and the united action is greater than that which would be attained with a single graduated wedge. It will thus be seen that the links 20 of each horizontal row constitute a train of links

connected by the cam plates 15. By reciprocating a key in said row, said train of links is changed in length. In the form of the invention here shown, the pushing in of the key increases the length of the train, but it is evident that this arrangement is not essential to the operation of the invention, as the same result could be obtained by shortening the length of the train upon the pushing in of the key. The increase in length of the train has the effect to a certain degree of filling up the compartment in the vertical channel 44, so that after a predetermined number of such keys have been operated, said compartment is completely filled. The filling up of the compartment of course prevents the further operation of any other train corresponding to the said vertical compartment. Said vertical compartment, the rollers and the blocks therein thus constitute an interlocking mechanism for all the trains of the links and spreaders or cam plates.

If it is intended to employ a machine in which the voter can change his vote before leaving the booth without erroneously affecting the registering device, the above interlocking mechanism lends itself readily to this construction: for the effect of retracting the voting key will be to withdraw the links of the train, on the left, as far as they were previously advanced when the key was pushed in. Also all the trains of links and likewise the stop blocks will be returned to their normal position, when all the keys which have been actuated are returned to their normal position. The keys are returned by a mechanism such as that illustrated in Figs. 2 and 3, in which shafts carry a bar 60 on the top of the machine, operated by the exit of the voter, rocks cranks 61 on vertical rock shafts 62, which rock arms 63, one for each unit of the machine, said arms engaging bosses 65 on the rods 5 to restore the same, to their normal position. This construction also lends itself to voting a straight ticket vote, which will be done by depressing the lever 70. This lever has connected thereto a crank 71 which engages a horizontal arm 72 on a vertical rock shaft 73 by which it rocks said shaft. Rigidly connected to said shaft are the springs 74, the outer ends of which springs engage with the pins 75 on the arms 76, which arms are loosely mounted on the shaft 73. When the shaft 73 turns the arms 76 engage with the channels 10 in its column and moves all the keys 5 connected thereto to voted position.

The units of the machine are assembled in vertical columns, and are tied together first, by means of rods 80 passing through apertures in the base plates 7; said plates being spaced vertically by sleeves 81 around said rods. The plates 9 are slotted, as at

82, to let said rods and sleeves pass there-through, and said slots, around said sleeves form additional guides for said plates in their reciprocation; secondly, by means of rods 83 at the rear of the column, the plates 7 being spaced vertically by sleeves 81 around said rod 83; thirdly, by rods 85 passed through apertures 86 in the front left hand corner of the plates. The adjacent columns are assembled, horizontally, first by means of ears 87, projecting from the sleeves 84 into the next column, and lying between apertures 88 in the plates 7 of said column, and rods 89 passed through said apertures 88 and through apertures 90 in the ears, and secondly by the rods 85 which are passed not only through the apertures 86 in the plates, but also through apertured forked extensions 92 of the blocks 6. Between said extensions 92 are passed the hinges 86 of the front plates 94 which carry the names of the candidates, the rod 85 thus serving as a hinge pin. The other edge of said plate carries hooks 95, which come behind lugs 96 carried by a flat rod 97 passing through holes in the plates 7. By lifting the rod 97 the plate 94 is free to swing on its pivot, and, on dropping said rod, said plate is latched thereby.

The arrangement for voting the scattering vote comprises a roll of paper 98 covered by lids 99 which are operated by the keys to uncover spaces on the roll on which the voter can write the names of un-nominated persons. Said keys are restored to their normal positions in the same way as the other keys. The blocks 39 are inclosed in a vertical channel 100, of thin metal, substantially U-shaped in horizontal section, enlarged laterally near its open end to form the vertical channel 44 for the rollers, and being strengthened on each side by the U-shaped beams 101, of thick metal, which, with the thin metal lining, form the vertical walls of the channel, both the thick and the thin metal being apertured to permit the bolts 145 to pass therethrough. Said channel is surrounded on three sides by thin horizontal plates 103, alining with the base plates 7, said plates 103 being turned up, as shown at 104, to carry a bearing 105 for the tube 31, and being also turned up at 106 and secured to the side of the channel 100. Said plates 103 are turned up to form vertical portions 109, each secured to the plate 103 above it, which portions 109 also contain the ends of strengthening rods 110 which enter the tubes 31 and upon which said tubes slide in their reciprocation.

It will be observed that this whole arrangement of interlocking mechanism has for its object to reduce the vertical distance between the keys to the smallest possible dimensions, while still permitting interlocking between keys of different rows and dif-

ferent columns. By the present arrangement of multiple wedges, it will be seen that the vertical distance from key to key can be reduced to three-eighths or one-half an inch, while still permitting accuracy and efficiency in interlocking. This enables the three counting wheels for each key to be arranged in approximately the same plane, as indicated in dotted lines in Figs. 1 and 4, so that a space is provided for the name of about three-eighths of an inch high and two and one-half to three inches long, which is the most convenient form of name space, permitting the name to be printed in large bold type easily read by the voter. In the voting machines now upon the market the name space is generally an inch square, providing too great a height and too short a length, necessitating the name being broken up, the initials being placed above and the surname below and even then requiring the use of small type to place the name in this short name space. By my invention ample space is provided for the name without unduly increasing the front surface of the voting machine. This construction also enables the names of all candidates of the same party to be placed in the same column. The front of the voting machine therefore in my construction corresponds as nearly as possible with that of the ordinary form of ballot sheet in use where voting machines are not employed.

I shape my stop blocks 39 with the successive steps on each side thereof to increase the accuracy and safety of the interlocking mechanism as a whole. It will be seen that if the bevels connecting the successive steps contact with the spreading rollers 43, a very slight forward movement of the stop block 39 will cause the rollers to spread as much as though the stop block were advanced the full length of the step. Only a small fraction of the forward movement of each step is active in spreading the rollers. The rest of the forward movement in spreading the stop block is idle, so that the stop block, having overcome the resistance of the rollers at the beginning of its movement for each step, will move through the balance of its movement with the greatest of freedom, and in turn the crowding together of the rollers by the movement of another stop block will not react on the stop blocks that have already been advanced, tending to return them to their original position. Furthermore, after the stop block has spread the rollers it throws no bending stress whatever on the channel 44 until the next step of the stop block encounters the rollers. If the stop block has been forced to voted position by undue pressure, it no longer tends to spring the channel 44 in the direction of the movement of the stop block but can only exert a longitudinal stress along the chan-

nel. It has been found that this result is a material one in interlocking mechanisms of this type, in which the springing of the channel in the direction of movement of the stop blocks can sometimes introduce a serious error into the working of the interlock.

It will be seen that the cam plate 15 is the equivalent in some respects to the wedge that has been used in interlocking mechanisms heretofore, and that the links 20 correspond in some respects to the blocks that have been used in interlocking mechanisms heretofore, and for convenience these parts may be referred to by the terms "wedge" and "block" respectively. It will also be seen that the stop block 39 may properly be called a wedge or a progressively movable wedge, or interlocking wedge, for such in effect is its function, forming as it does part of the interlocking system of the machine.

It is obvious that numerous changes may be made in the details of my invention without departing from the spirit of it. For example, the position of the cams 16 in the plate 15 may be reversed so as to make the links 20 draw together when the key is pressed in, which effect may also be secured by drawing the key out to voted position instead of pushing it in. It is also obvious that the stop blocks 39 may be pushed into engagement with the rollers 43 instead of pulled into engagement therewith, and if the position of the cams 16 be changed to make the links draw together the stop blocks 39 can be drawn in directly by their respective trains.

I claim:—

1. In interlocking mechanism for party column voting machines, the combination of a plurality of rows, three or more in number, of voting keys, transverse guides reciprocated thereby, spreading devices reciprocated therewith but freely movable on the transverse guides, connecting devices joining said spreading devices and forming a train therewith, said operating devices operating to positively spread apart or draw together said connecting devices and lengthen or shorten the train, and a locking device at one end of the trains, arranged to be positively actuated by any one of the trains, and locking the action of the remaining keys when a predetermined number of such keys have been operated, substantially as described.

2. In interlocking mechanism for party column voting machines, the combination of a row of voting keys, transverse guides reciprocated thereby, spreading devices reciprocated therewith but freely movable on the transverse guides, connecting devices joining said spreading devices and forming a train therewith, said operating devices op-

erating to positively spread apart, or draw together said connecting devices and lengthen or shorten the train, and a locking device arranged to be positively actuated by the movement of said train, said locking device being provided with parts arranged to be moved by a plurality of such trains and to be locked by the operation of a predetermined number of keys of a plurality of such rows, substantially as described.

3. In interlocking mechanism for party column voting machines, the combination of voting keys, spreading devices reciprocated thereby but freely movable transversely to the direction of reciprocation, links between the spreading devices and spread and drawn together thereby and a locking device operated by the train of links, substantially as described.

4. In interlocking mechanism for party column voting machines, the combination of voting keys, transverse guides reciprocated thereby, slotted cams freely movable on said guides and reciprocated therewith, links between the cams and positively connected thereto and spread thereby, and a locking device at one end of the train of links, substantially as described.

5. In a voting machine, the combination of a row of voting keys, spreaders actuated by the keys, a train of links positively connected to and moved apart and together by said spreaders in a direction at right angles to the movement of the keys, and a vertical interlocking device at right angles to the train of links and adapted to be actuated by a plurality of such trains and to be locked by the operation of a predetermined number of keys thereof, substantially as described.

6. A voting machine, comprising a row of voting keys, spreaders actuated by the keys, devices between the spreaders and positively connected thereto moved laterally thereby both apart and together, and a vertical interlocking device at one end of a series of such devices adapted to be actuated by a plurality of such series and to be locked by the operation of a predetermined number of keys, substantially as described.

7. In interlocking mechanism for party column voting machines the combination of a plurality of rows, three or more in number, of reciprocating keys, transverse guides reciprocated thereby, devices reciprocated by, but freely movable transversely on, the transverse guides, the devices in each row being positively connected by links to form a train changeable in length by the reciprocation of one or more of said devices, said devices serving to spread said links apart or draw them together, and a locking device for all the trains, arranged to be actuated by such changed length of any one of the trains and locking the action of the remaining keys of said rows when a predetermined number

of such keys have been operated, substantially as described.

8. In interlocking mechanism for party column voting machines, the combination of a plurality of rows, three or more in number, of reciprocating keys, interlocking devices positively connected together in a train for each row of keys parallel with said row, and operatively connected with said keys to progressively change in length with the reciprocation of one, two, three, or more, of the keys of said row, the members of said train being positively spread apart or drawn together by the reciprocation of said keys, and a locking device for all of said trains progressively operated by said progressive change in length of any one of said trains, substantially as described.

9. In interlocking mechanism for party column voting machines, the combination of a plurality of rows, three or more in number, of reciprocating keys, interlocking devices positively connected together in a train for each row of keys parallel with said row, and operatively connected with said keys to progressively change in length with the reciprocation of one, two, three, or more, of the keys of said row, the members of said train being positively spread apart or drawn together by the reciprocation of said keys, and a locking device for all of said trains progressively operated by successive changes in length of a plurality of said trains, substantially as described.

10. In interlocking mechanism for party column voting machines, the combination of a plurality of rows, three or more in number, of reciprocating keys, interlocking devices positively connected together in a train for each row of keys parallel with said row, and operatively connected with said keys to progressively change in length with the reciprocation of one, two, three, or more, of the keys of said row, the members of said train being positively spread apart or drawn together by the reciprocation of said keys, and a locking device for all of said trains progressively operated by a progressive change in length of any one of said trains and by successive changes in length of a plurality of said trains, substantially as described.

11. In an interlocking mechanism for party column voting machines, the combination, with an interlocking channel and movable stops therein, as rollers, of a graduated stop block having a plurality of parallel steps and parallel sides on each side thereof movable across said channel, and means for moving said stop block thereacross a number of steps corresponding to the voting keys operated, substantially as described.

12. In an interlocking mechanism for party column voting machines, the combination, with an interlocking channel and mov-

able stops therein, as rollers, of a stop block of gradually increasing width having a plurality of parallel steps and sides on each side thereof movable across said channel, and means for moving said stop block thereacross a distance corresponding to the voting keys operated, substantially as described.

13. In a voting machine, the combination of a row of voting keys, spreaders individually operated thereby, links positively connecting the spreaders to form a train, said devices serving to spread said links apart or draw them together, and a vertical locking device arranged to receive a plurality of step by step movements by the successive operation of a plurality of keys of said row, substantially as described.

14. In a voting machine, the combination of push rods, spreaders moved at right angles to said rods, said spreaders having a series of two or more steps thereon, stop blocks moved by said spreaders, but movable at right angles thereto independently thereof, a channel in which said blocks move and movable stops in said channel, substantially as described.

15. In a voting machine, the combination of the cams 15 having converging slots 16, means for reciprocating said cams with the voting keys, links 20 connecting the cams, having apertures at their ends, and removable pins through the apertures in the link ends and the slots, substantially as described.

16. In a voting machine, the combination with the voting keys, of interlocking mechanism comprising a channel, wedges moved in said channel each by the operation of a single voting key, hollow rollers of uniform size alternating with, and arranged to contact with, and spread, the wedges, and pins entering certain of said rollers to change the same into abutments, the sides of the channel being provided with holes at equal distances apart to receive the pins, the remaining hollow rollers then acting as stop blocks, substantially as described.

17. In a voting machine, the combination with the voting keys, of interlocking mechanism comprising a channel, wedges moved in said channel each by the operation of a single voting key, spacing elements of uniform size alternating with, and arranged to contact with, and spread the wedges, and means for fixedly securing any selected elements of the whole number, which thereby serve as abutments, the remaining elements then acting as stop blocks, said wedges having a series of two or more steps thereon, substantially as described.

18. In a voting machine, the combination with the voting keys, of interlocking mechanism comprising a channel, wedges moved in said channel by the operation of the voting keys, each wedge consisting of a single rigid body, spacing elements of uniform size

alternating with, and arranged to contact with, and spread the wedges, and means for fixedly securing any selected elements of the whole number, which thereby serve as abutments, the remaining elements then acting as stop blocks, said wedges having a series of two or more steps thereon, substantially as described.

19. In interlocking mechanism for party column voting machines, the combination of a line of voting keys, a train of links, means for spreading the same when one or more keys are operated, an interlocking channel at right angles to the train, a stop block therein movable across said channel in a direction parallel with the train, arms pivotally extending from the stop block and from the end of the train and transversely thereto and to the channel, and a pivot rod connecting the outer ends of said arms, parallel with said train and stop block, substantially as described.

20. In interlocking mechanism for party column voting machines, the combination of a reciprocating device adapted to be operated by the voter, an interlocking channel at right angles thereto, a stop block therein movable across the channel in a direction parallel with the device, arms extending from the stop block and from the end of the device, transversely to the device and channel, and a pivot rod connecting the outer ends of said arms, parallel with said device and block, substantially as described.

21. In a voting machine, the combination of voting keys, trains of spreaders moved thereby, an arm swinging from the end of each train at right angles thereto, a stop block for each train, an arm on which it swings, connected to the first named arm, a channel in which said stop blocks move, and movable stops in said channel interposed between said stop blocks, substantially as described.

22. In a voting machine, the combination of a series of plates attached together in a horizontal row, a voting key for each plate, a spreader for each key, a link between adjacent spreaders positively connecting them together, said spreaders serving to spread said links apart and draw them together, and a locking mechanism at the end of the series arranged to be operated by the movement of said keys, substantially as described.

23. In a voting machine, the combination of a row of plates, detachably connected with each other, a row of push rods moving on said plates, spreaders actuated by the push rods, links positively connected with the spreaders to form a train, said spreaders serving to spread said links apart and draw them together, and an interlocking device arranged at right angles to the train of links and adapted to be actuated by a plurality of such trains and to be locked by

a predetermined number thereof, substantially as described.

24. In a voting machine, the combination, with the frame comprising rows of plates, of a front plate 94 hinged at one side and at the other side having hooks 95 entering between the horizontal plates, and a vertical rod 97 carrying lugs engaging all of said hooks simultaneously, substantially as described.

25. In a voting machine, the combination of a vertical series of plates, each series having vertically aligned apertures, vertical rods through said apertures, shells around the rods between the plates for spacing the same, said shells having apertured ears projecting into the next vertical series of plates, and vertical rods passing through said ears and apertures in said plates, substantially as described.

26. A voting machine comprising units detachably assembled together, each unit comprising a unit plate or frame, a voting key, three counting wheels, and a portion of an interlocking mechanism, the unit plates being all detachably secured together, and the portions of the interlocking mechanism being secured together in series, said machine also comprising means cooperating with the series of portions, for locking the remainder of the keys, when a predetermined number have been operated, substantially as described.

27. In a voting machine, the combination of a vertical series of reciprocating rods, interlocking devices operated thereby, a shaft arranged parallel with said series and a spring yieldingly connecting said shaft with each of said rods, substantially as described.

28. The combination in an interlocking mechanism of a plate having diverging cams therein, adjacent interlocking blocks positively connected to said cams, said blocks being positively moved apart or drawn together by the reciprocation of said plate.

29. The combination in an interlocking mechanism of a plate having diverging cams therein suitably spaced apart, adjacent interlocking blocks positively connected to said cams, said blocks being positively moved apart or drawn together by the reciprocation of said plate.

30. The combination in an interlocking mechanism of a train comprising a series of interlocking blocks, a connection between consecutive ones of said interlocking blocks, having diverging cams therein, said blocks being positively separated and drawn together by the reciprocation of the connection, whereby the length of the interlocking train may be positively changed.

31. In an interlocking mechanism, an interlocking train comprising a series of in-

terlocking blocks arranged in a row, a wedge operating between each two consecutive blocks, each of said wedges being directly and positively connected to its adjacent blocks, and each of said blocks being directly and positively connected to its adjacent wedges, said wedges operating to push said blocks apart and draw them together.

32. In an interlocking mechanism, an interlocking train comprising a pair of interlocking blocks with an interlocking wedge therebetween, connections between said blocks and wedge whereby the reciprocation of said wedge will drive said blocks apart and bring them toward each other.

33. An interlocking train comprising cam plates, interlocking blocks or spacers, slotted connections between said cam plates and blocks acting to change the length of the train when the cam plate is moved laterally.

34. In an interlocking mechanism, a wedge shaped plate having a series of parallel steps arranged progressively on the opposite sides thereof, bevels on each side thereof connecting the successive steps.

35. The combination of a series of interlocking blocks arranged in a row, spreaders or wedges arranged between the consecutive blocks and connected thereto to positively spread or draw said blocks together, a progressively movable wedge attached to the end of the row of blocks, said wedge being positively advanced or retracted by the movement of the spreaders in its row.

36. In an interlocking mechanism, the combination of two blocks having pins on each end thereof, a plate connecting said blocks, two diverging cam slots cut in said plate, one of said slots engaging with the pin on one end of one block and the other slot engaging with the other pin in the adjacent end of the other block.

37. In an interlocking mechanism, the combination of two blocks, a cam plate connecting said blocks, said plate having two diverging cam slots cut therein, one of said cam slots engaging one of the blocks and the other cam slot engaging the other of the blocks.

38. In an interlocking mechanism, the combination of two blocks, a cam plate connecting said blocks, said plate having two diverging cam slots cut therein, one of said cam slots engaging one of the blocks and the other cam slot engaging the other of the blocks, whereby the reciprocation of said cam plate will cause said blocks to move toward and away from each other.

39. The combination in interlocking mechanism, of a multicandidate group of voting devices, of a stepped interlocking wedge having its side indented with a series of parallel steps.

40. The combination in interlocking mechanism, of a multicandidate group of voting

devices, of a stepped interlocking wedge having its side indented with a series of parallel steps, arranged progressively thereon.

41. The combination in interlocking mechanism, of a multicandidate group of voting devices, of a stepped interlocking wedge having its side indented with a series of parallel steps, arranged progressively thereon, bevels connecting each step with the adjacent steps.

42. The combination in interlocking mechanism, of a multicandidate group of voting devices, of a stepped interlocking wedge having the opposite sides thereof indented with a series of parallel steps, bevels connecting the adjacent steps.

43. The combination in interlocking mechanism, of a multicandidate group of voting devices, of a stepped interlocking wedge having opposite sides indented with a series of parallel steps arranged symmetrically.

44. An interlocking wedge having two interlocking edges, one of said edges being thick and the other thin, the thick edge being recessed longitudinally.

45. A series of interlocking wedges arranged parallel to each other, each of said wedges having two interlocking edges, one of said edges being thick and the other edge thin, the thick edge of each wedge being recessed to receive the thin edge of the next adjacent wedge.

46. An interlocking mechanism comprising a channel, rollers engaging with said channel, wedges placed between said rollers, each of said wedges having a series of stepped parallel sides, each of which sides engages with a roller as said wedge is advanced or retracted through a plurality of steps.

47. In an interlocking mechanism, the combination of an interlocking channel, rollers carried therein, progressively movable wedges between consecutive ones of said rollers, said wedges presenting successive parallel sides at regular intervals to said rollers through a plurality of steps.

48. The combination in an interlocking mechanism of a channel, rollers carried in said channel, interlocking wedges between consecutive rollers, said wedges having stepped sides engaging with said rollers, said rollers being capable of moving said wedges endwise when engaging with the intervals between consecutive stepped sides, but being incapable of moving said wedges endwise when engaging with any of the parallel sides.

49. A key controlling device for voting machines including a plurality of laterally movable wedge shaped plates, one for each office to be filled, and means for successively and progressively moving said plates longitudinally through a series of steps, consisting

ing of a plurality of office groups of indicators, one group for each wedge shaped plate, each of said plates having a plurality of parallel sides thereon.

5 50. A key controlling device for voting machines including a plurality of laterally movable wedge shaped plates, one for each office to be filled, and means for successively and progressively moving said plates longitudinally through a series of steps, consisting of a plurality of office groups of indicators, one group for each wedge shaped plate, each of said plates having a plurality of parallel sides thereon arranged in pairs.

15 51. A key controlling device for voting machines including a plurality of laterally movable wedge shaped plates, one for each office to be filled, and a plurality of groups of indicators or keys, one group for each plate and operative to move said plate longitudinally, different distances proportional to the number of indicators or keys operated, each of said plates having a plurality of parallel sides thereon.

25 52. A key controlling device for voting machines including a plurality of laterally movable wedge shaped plates, one for each office to be filled, and a plurality of groups of indicators or keys, one group for each plate and operative to move said plate longitudinally, different distances proportional to the number of indicators or keys operated, each of said plates having a plurality of parallel sides thereon arranged in pairs.

35 53. A key controlling device for voting machines including a plurality of laterally movable wedge shaped plates, one for each office to be filled, and means for successively and progressively moving said plates longitudinally through a series of steps, consisting of a plurality of office groups of indicators, one group for each wedge shaped plate, and interlocking devices to limit the number of wedge shaped plates that may be progressively and longitudinally moved, each of said plates having a plurality of parallel sides thereon.

50 54. A key controlling device for voting machines including a plurality of laterally movable wedge shaped plates, one for each office to be filled, and means for successively and progressively moving said plates longitudinally through a series of steps, consisting of a plurality of office groups of indicators, one group for each wedge shaped plate, and interlocking devices to limit the number of wedge shaped plates that may be progressively and longitudinally moved, each of said plates having a plurality of parallel sides thereon arranged in pairs.

60 55. A key controlling device for voting machines including a plurality of laterally movable wedge shaped plates, one for each office to be filled, and a plurality of groups of indicators or keys, one group for each

plate and operative to move said plate longitudinally, different distances proportional to the number of indicators or keys operated, and interlocking devices to limit the number of wedge shaped plates that may be progressively and longitudinally moved, each of said plates having a plurality of parallel sides thereon the distance between centers of consecutive sides corresponding to the distance through which said plate is advanced by the voting of each key.

56. A key controlling device for voting machines including a plurality of laterally movable wedge shaped plates, one for each office to be filled, and a plurality of groups of indicators or keys, one group for each plate and operative to move said plate longitudinally, different distances proportional to the number of indicators or keys operated, and interlocking devices to limit the number of wedge shaped plates that may be progressively and longitudinally moved, each of said plates having a plurality of parallel sides thereon arranged in pairs.

57. In an interlocking mechanism, the combination of an interlocking train, a yoke connected to the end thereof, a wedge connected to said yoke and moved longitudinally forward or back by the train through said yoke.

58. In an interlocking mechanism, the combination of an interlocking train, a yoke swiveled on the end thereof, a swivel in said yoke, a wedge connected to said yoke by a swivel and moved longitudinally thereby, whereby said wedge is permitted a lateral movement, equal at both ends of the wedge.

59. The combination in a voting machine of a series of units, each of said units comprising voting, counting and interlocking mechanism, means for tying said units together in party columns, means for connecting successive party columns together in parallel relation to form a voting machine having keys arranged in party columns and office lines transverse thereto with interlocking mechanism in each office line controlling the keys thereof.

60. In an interlocking mechanism for a voting machine, the combination of a wedge and spacing devices contacting therewith, said wedge having a series of parallel stepped sides on one side thereof and being capable of making a series of successive displacements of said spacing devices as said wedge is advanced progressively.

61. In an interlocking mechanism for a voting machine, the combination of a wedge and spacing devices contacting therewith, said wedge having a series of parallel stepped sides on each side thereof and being capable of making a series of successive displacements of said spacing devices as said wedge is advanced progressively.

62. In an interlocking mechanism for a

voting machine, the combination of a wedge and spacing devices contacting therewith, said wedge having a series of parallel stepped sides on both sides thereof and being capable of making a series of successive displacements of said spacing devices as said wedge is advanced progressively.

63. In an interlocking mechanism for a voting machine, the combination of spacing devices and an interlocking wedge for spreading them, said wedge having a plurality of parallel sides with a plurality of parallel bevels between said sides, each of said sides and each of said bevels constituting a step, the number of said successive steps on each side of said wedge corresponding to the number of party lines of voting devices in the machine in which said wedge is to be used.

64. An interlocking wedge having on one side thereof, a series of uniform indentations, the part cut away from each of said indentations having the shape of an obtuse triangle.

65. An interlocking wedge having on op-

posite sides thereof a series of uniform indentations, the part cut away from each of said indentations, having the shape of an obtuse triangle.

66. An interlocking wedge having on opposite sides thereof a series of indentations, each indentation having the shape of an obtuse triangle, each side of the wedge being formed of a separate piece, said pieces being rigidly and symmetrically fastened together to form the wedge.

67. The combination in a voting machine of interlocking devices arranged in parallel office lines, a progressively stepped wedge connected to the end of each line and operated progressively thereby and means for limiting the movement of said stepped wedges.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FRANCIS M. WRIGHT.

Witnesses:

STACY W. GIBBS,
CHAS. W. SMYTH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."