

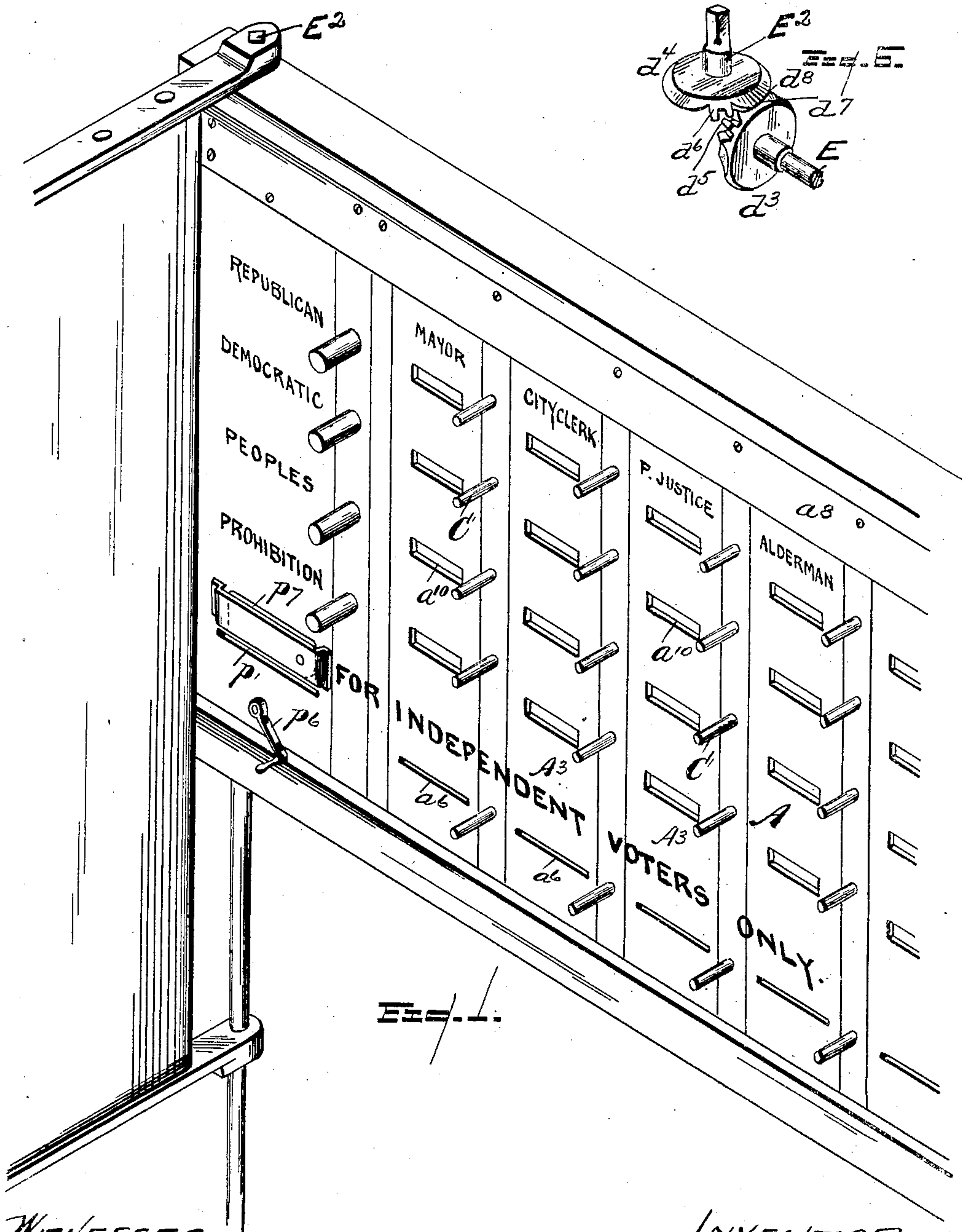
C. A. BENKE.
VOTING MACHINE.

APPLICATION FILED JULY 11, 1900. RENEWED MAY 14, 1906.

932,750.

Patented Aug. 31, 1909.

6 SHEETS—SHEET 1.



WITNESSES
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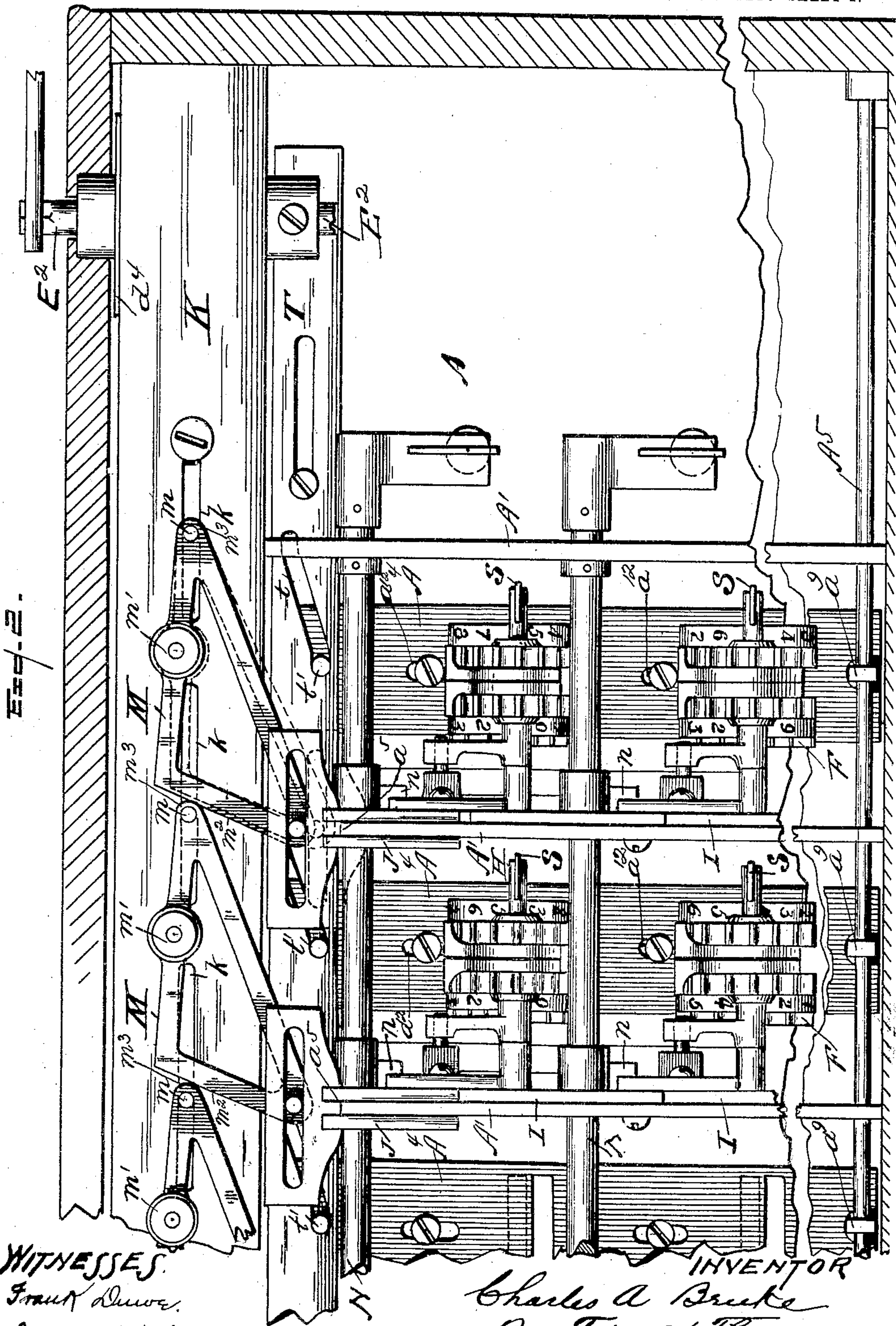
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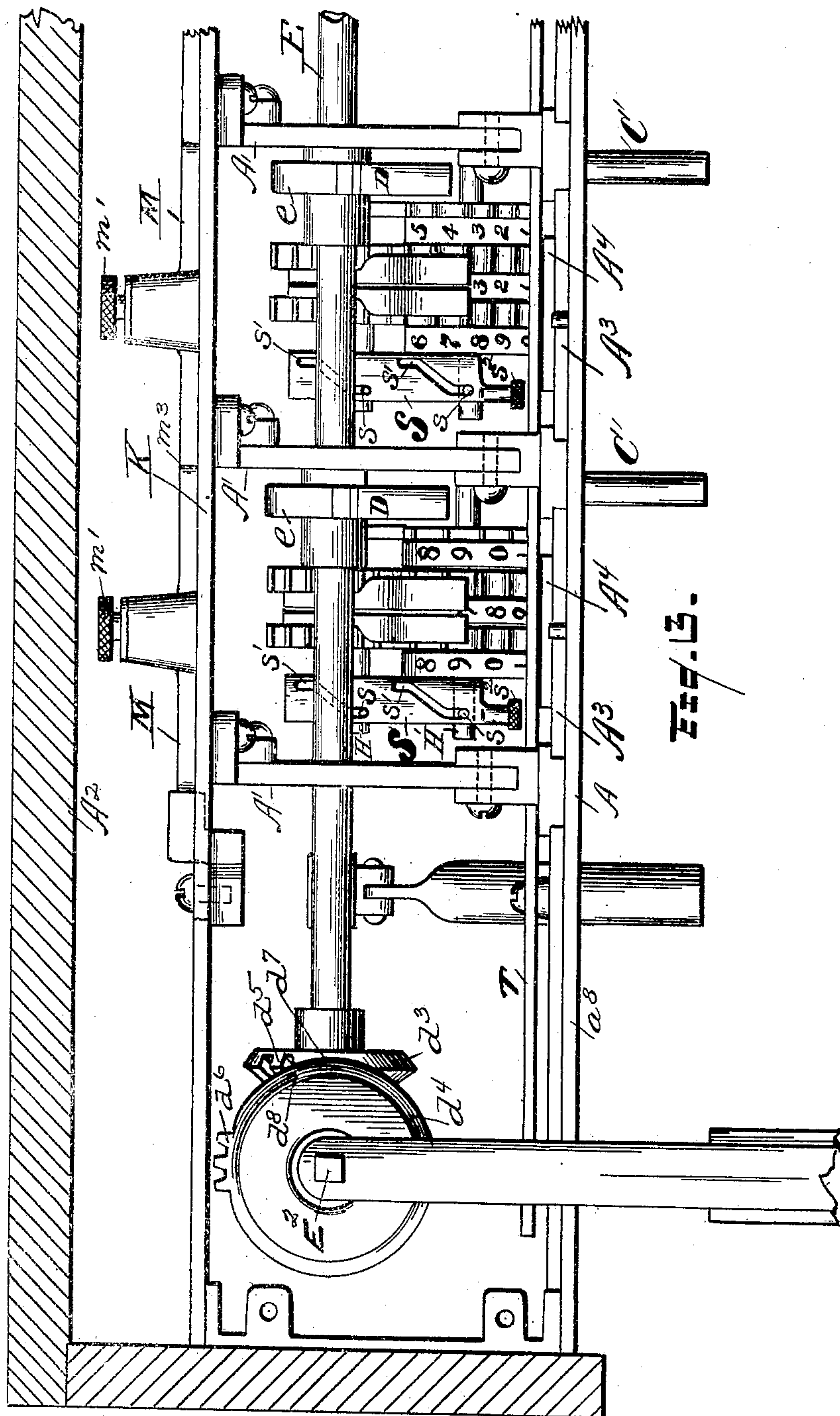
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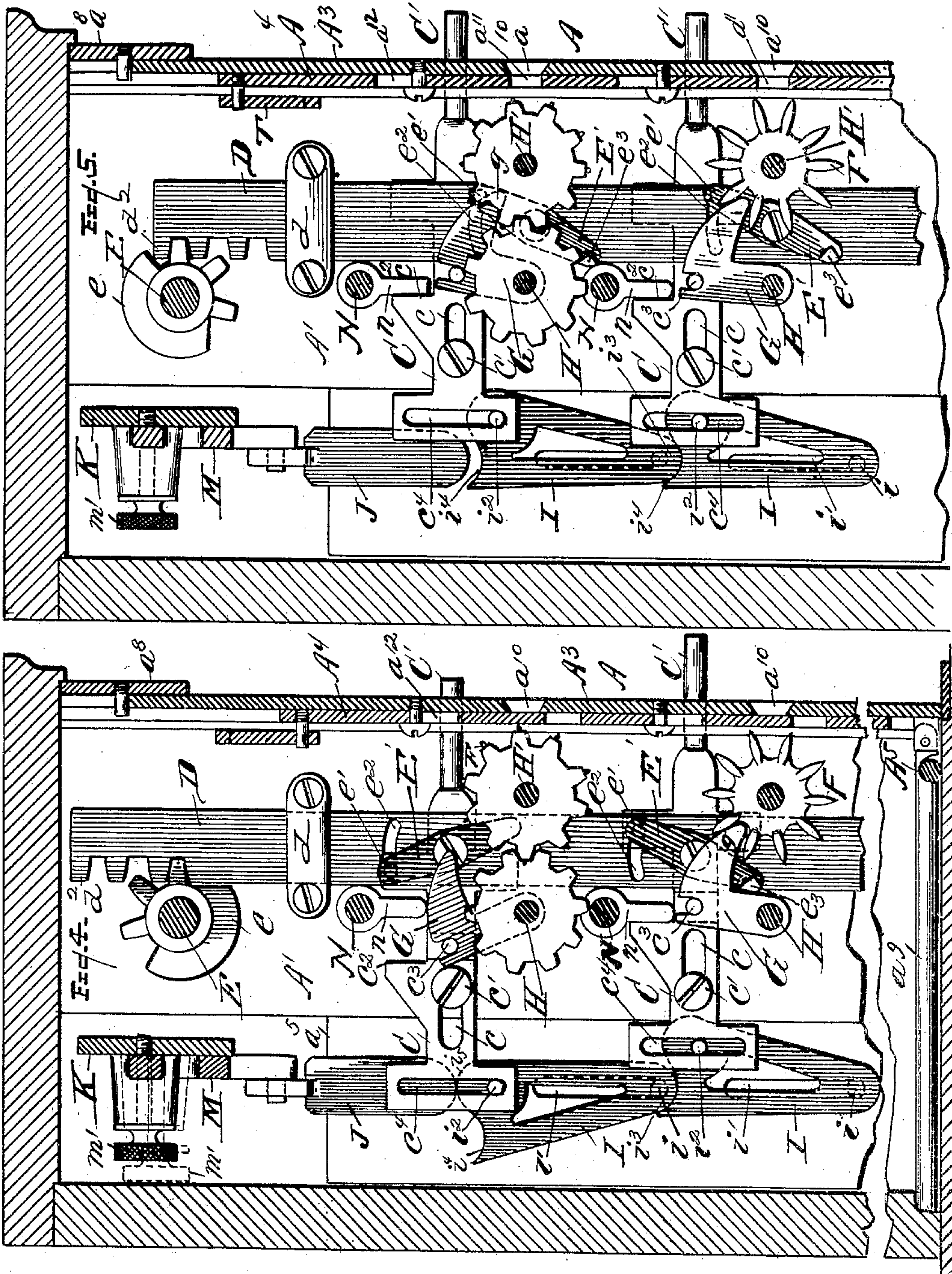
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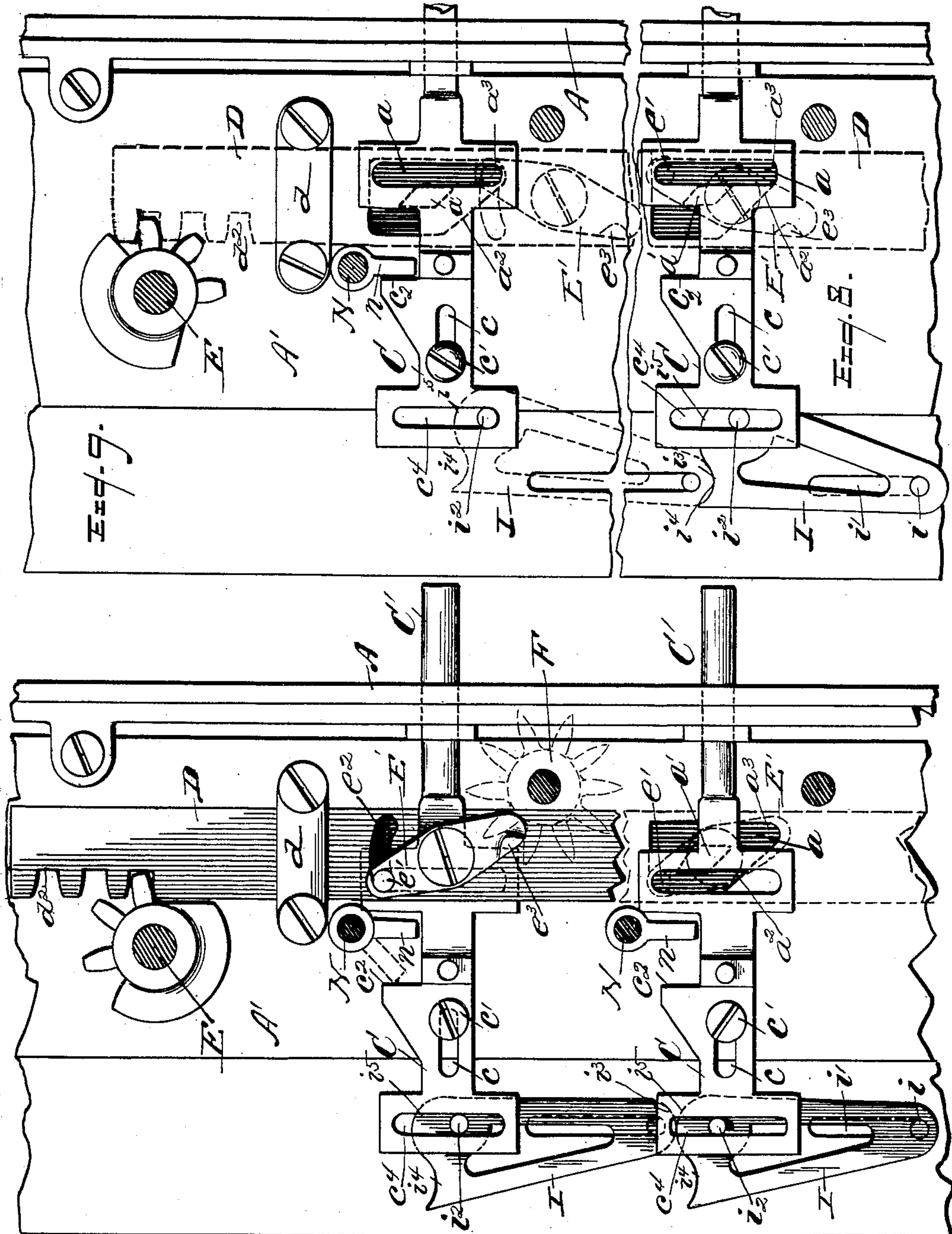
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5 SHEETS—SHEET 5.



WITNESSES.

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Fig. 10

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UNITED STATES PATENT OFFICE.

CHARLES A. BENKE, OF DETROIT, MICHIGAN, ASSIGNOR TO JOHN HOWARD McELROY, OF CHICAGO, ILLINOIS.

VOTING-MACHINE.

932,750

Specification of Letters Patent.

Patented Aug. 31, 1909.

Application filed July 11, 1900, Serial No. 23,170. Renewed May 14, 1906. Serial No. 316,632.

To all whom it may concern:

Be it known that I, CHARLES A. BENKE, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Voting-Machines, and declare the following to be a full, clear, and exact description of the same, such as it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention is concerned with a novel interlocking mechanism for use in voting machines, and is designed especially for that class of ballots where the candidate selecting keys are arranged in party rows or columns and in transverse office columns or rows, and is adapted to produce a device of the class described, in which the same office rows, up to any number that may be required, can be separated for single candidate offices or grouped together for multi-candidate offices, as the requirements of the especial election at hand may demand.

In carrying out my invention, I provide a separate row of interlocking elements for each office row of keys, and a supplemental transverse row of interlocking elements, a number of which, corresponding to the number of the office rows of interlocking elements, are adapted to be acted upon by the office row interlocking elements, so that the total action of the keys directly upon their interlocking elements is summed up, as it were, upon the transverse row, whether the keys actuated are one in each office row or several in some of the rows and none in others. It will thus be seen that the supplemental interlocking elements must be capable of being moved varying distances, from that caused by the actuation of one key in its associated office row to that caused by the actuation of all the keys in its office row. Then by providing mechanism whereby these transverse elements may be held from more than one key movement, or permitted to move within the limits of the desired group, I am enabled to arrange the office rows in multi-candidate groups of any desired size, or separate them for single-candidate voting.

One novel feature of my invention con-

sists of giving the elements of the transverse row a rotary movement.

Another novel feature consists in using a connection between the primary or office row interlocking elements and the secondary or transverse interlocking elements that permits the transverse movement of the latter elements without affecting the former.

Another novel feature consists in constructing the elements of the transverse row so that they will act directly upon each other instead of through some intermediate elements.

While my present application is concerned only with the interlocking mechanism of a voting machine, I have shown and described a complete voting machine, as will be seen by preference to the accompanying five 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 perspective view of the machine as seen from the exterior, showing the general form of the machine and the arrangement of the voting keys; Fig. 2 is a rear view of four sets of registering devices as they are arranged to count the votes of two candidates for each of two offices; Fig. 3 is a plan view of that part or parts of the machine shown in Fig. 2, part of the shafts H and H' being broken away to show the plates S; Fig. 4 is a cross sectional view of one of the sections, showing the upper key set for voting, with the registering bar elevated and the arm carried thereby in position to engage the registering wheel when the registering bar is moved downward; also showing the registering wheels removed from the lower registering device to more clearly show the construction of the parts; Fig. 5 is a similar view, showing the registering bar at its lowermost position; Fig. 6 is a detail of the operating gears; Fig. 7 is a cross sectional view showing the registering bar raised in the position it occupies when the door is closed on the voter, with the numbering wheels and other parts removed to show the cam by which the keys are returned after being voted; Fig. 8 is a similar view, showing the registering bar at its upper position, and showing the relative position of the swinging arm and its actuating cam before the key is set for voting; and

Fig. 9 is a similar view, showing the registering bar at the lower extremity of its movement, and showing the relative position of the swinging arm, the key, and the cam back of the arm and key.

In the drawings, A represents the front wall of the machine, preferably consisting of a large metal plate; A' A' the interior partitions or cross walls of the case, and A² the rear wall. In Fig. 1, I show four horizontal rows or series of keys, each row or series representing the candidates of a party for all the offices; the lower row representing a series of keys and adjacent openings in which to vote the independent ticket. Corresponding keys of candidates for the same office are arranged in horizontal series so as to come in a vertical line with each other, thus forming a vertical column of four in each office series. Within the case of the machine and at right angles to the front wall are mounted the cross partitions A', there being one partition between the adjacent series of vertical keys, and a partition on the right and left of the right and left set of keys, forming an end wall or frame for the mechanism in the case.

C' C' are the operating keys, preferably extending through the front wall of the case and outward a sufficient distance to allow for the horizontal movement for operating the mechanism within the case moved by the key. Suitable means are preferably provided for coloring the ends of the keys with a separate color for each horizontal party series. On the left of the bank of keys is a vertical series of keys commonly called straight-ticket keys, by which suitable mechanism is operated for voting, or setting in position for voting, the entire party vote. This is to distinguish from the candidate keys, by which term I shall designate the keys for operating the mechanism for single candidates, as distinguished from the straight-ticket keys. Each key is connected to or formed integral with the actuating plate C. This plate is supported on the adjacent cross partition A' by a slotted connection, this connection consisting of a horizontal slot *c* in the plate, through which passes a supported screw *c'*. The slot permits a horizontal movement of the actuating plate by the action of the key and limits this movement within the confines necessary to its function.

One of a series of vertical registering bars D is mounted parallel with each of the cross partitions or frames of the machine, and is only a sufficient distance from the frame to permit the actuating plate C to lie between the bar and the partition. This bar is held in vertical alinement by guides *d*, and has a vertical movement. Its primary function is to operate such of the registering mechanisms as have been put in

position for engagement with the registering wheels by the operation of the voting keys. The registering bars D are thus adapted, through the setting of the voting keys, to actuate any selected one of the registering mechanisms connected with a single office. This registering bar is raised and lowered within the limits of its movement by the opening and closing of the door of the booth containing the machine, through means consisting of a horizontal shaft E extending lengthwise through the machine, gears *e e* arranged to mesh with the rack *d² d²* on the several registering bars, by the operation of which each of the registering bars is raised and lowered as the shaft E is oscillated, and means for oscillating the shaft a fixed and definite distance in each direction, consisting of a mutilated bevel gear *d³* on the shaft, and a like bevel gear *d⁴* mounted in a bearing on the frame above the shaft.

d³ is a mutilated bevel gear having but two teeth *d⁵* that mesh with teeth *d⁶* on the bevel gear *d⁴*. The bevel gear *d³* is cut away on each side of the teeth *d⁵ d⁵*, leaving a concave surface *d⁷* that conforms to, and registers with, the convex surface *d⁸* of the plain portion of the bevel gear *d⁴*. This construction is such that after the bevel gear *d⁴* has given the shaft E a partial rotation through the meshing and inter-action of the toothed parts of the two bevel gears, the two bevel gears become locked together by the engagement of the concave portion of one with the convex surface of the other, so that the bevel gear *d⁴* can be rotated any distance necessary to give the door of the cabinet the proper travel without moving the shaft E beyond the limited movement prescribed. This locking or holding of the shaft E against excessive movement operates the same in each direction, so that the opening and closing of the door of the cabinet, through the operation of the bevel gear described, gives to the shaft E and to the registering bars D a fixed definite movement in each direction and holds them against any further or excessive movement in either direction. Any suitable lever mechanism that is desired may be employed between the door of the cabinet and the bevel gear *d⁴*. The adjustment of the parts of the hereinafter described is such that when the door of the cabinet is open the registering bar D is at the lowermost point of its travel. The parts operated by this registering bar will therefore be described from the lowermost point of the registering bar. This position of the parts is shown in Figs. 5 and 9.

On each of the registering bars are loosely mounted a series of short arms E' E'. Each arm is provided with a pin *e'* which extends inward through a transverse slot *e²* cut in the bar D, and through the slot *d⁵* in the actuat-

ing plate C to some distance beyond the plate to adapt it to enter the depression hereinafter described, in the partition. This construction allows the arm E' to have an oscillating movement within the limit prescribed by the transverse slot e^2 when the arm is at the uppermost point of its movement.

Back of the registering bar, beyond the plate C and opposite each of the arms E', is cut a rhomboidal-shaped depression a in the partition or interior frame A' of the machine. Within this depression is an outstanding cam a' , which occupies the central portion of the depression. This depression is rectangular in form, except at the lower left-hand corner, where the wall is set at an incline a^2 leading from about the center of the left-hand wall downward and to the right to, or toward, the right-hand lower corner of this depression. This depression in the partition wall receives the pins e' and allows the registering bar carrying the arm E' to move up and down. When the registering bar D is at the lowermost point of its movement, the pin e' is carried to the lowest corner of the depression, and if when the downward movement of the registering bar commences, the lower end of any or all of the levers E' have been swung to the inward limit allowed to them by the transverse slot e^2 , they will be brought back to the forward limit of their movement by the contact of the pin e' with the cam or incline a^2 in the depression. Thus the upper ends of the arms E' each can have an inward movement when the registering bars D are at the upper limit of their movement, but when the registering bars are at the lower limit of their movement, each of these swinging arms is held to the outer limit of its movement in the corner a^3 of the depression. As the voting keys are connected with these arms E' by the pin e' and slots c in the plate C, they are likewise fixed or locked in position when the registering bar is at the lower extremity of its movement. Likewise, as the downward movement of the registering bar carries the upper end of the lever E' over to the outward limit of its movement through the action of the cam a^2 , any or all of the keys that have been pushed in will be returned to their outward limit whenever the registering bar is moved downward. Thus the construction described provides means whereby any one of the levers E' mounted on the registering bar can be pushed to the inward limit of its movement by the operation of the voting keys to their outward or normal position when the bar is depressed. Also when the upper ends of the levers E' are at the outward limit of their movement, or what may be called their normal position, the registering bar can be moved up and down freely by the opening of the door of the cabinet without operating or affecting

any part of the rest of the machine. Also, as all of the levers are at the lower limit of their vertical movement, and therefore held fixed when the door is open, no voting can be done on the machine except after the door has been closed on the voter.

I operate the registering wheels through the lugs e^3 on the lower ends of the arms E'. In the drawings, F represents the units registering wheel, F' the tens, and F² the hundreds, registering wheels. Each registering wheel consists of a plain disk having figures on the periphery, and a toothed wheel having a tooth corresponding with each unit figure. Suitable carrying and re-setting mechanisms are employed with these registers, but as they form no part of the present invention, they need not be here described. The unit wheel is moved forward one point as the registering bar D is moved downward whenever the arms E' located adjacent the unit wheel are in such a position as to bring the lug e^3 forward a sufficient distance to come between the teeth of the unit wheel. When the upper ends of the arms E' are at the forward end of their movement, and the lower ends of the arms E' with the lugs e^3 are at the inward end of their movement, the lugs are so far back that they pass up and down freely without engaging with the registering wheels; but if one of the keys be pushed out, it carries the upper end of the arm E' to the inward end of its movement, and the lower end of the arm E', with the lug e^3 , to the outward limit of its movement, and in such a position that the lug will engage with a tooth of the registering wheel as the registering bar carries the levers downward. As the upper ends of the arms E' can remain at the inner limit of their movement for only about one-half of the downward movement before the operation of the cam for returning it to its forward position comes into operation, the registering operation takes place during the first half of the downward movement of the registering bar. The remaining part of the movement has the effect of returning the arm to its normal position, and of disengaging the lug carried on the lower end of the arm from the registering wheel. Thus, the downward movement of the registering bar D, induced by the action of opening the door of the cabinet, moves the registering wheel that is connected with such key or keys as have been operated. As means hereinafter described are employed to prevent more than one key of a vertical series being operated, the downward movement of the registering bar registers only the vote selected by the operation of the single key.

In connection with the means described, for operating the registering wheels, I provide means for locking the unit registering wheels at all times, except when the mechan-

ism is moving the registering wheel in the regular operation of the machine. This means consists of the dog G (Figs. 4 and 5) pivoted on the shaft H and having an engagement with the actuating plate C through a pin c^3 which engages with a slot in the dog near its outer end; the construction being such as to cause the dog to move in and out by swinging on its pivot when the actuating plate C is moved in or out by the voting keys. When the voting key is pushed in and the actuating plate forced to the inward limit of its movement, the dog is swung out of its engagement with the registering wheel, but at other times the point g of the dog rests between the teeth of the units registering wheel and locks it. Thus the registering wheel is unlocked only when a key is voted and left voted during the registering operation of the machine.

I will now describe the means employed by me to prevent the voting of more than one key in each candidate series. Pivoted to the partition wall A', and in a depression therein, is a vertical series of locking levers I I. These levers are each pivoted by a screw or pin i having a slidable connection with the partition wall in a vertical slot i' to provide for vertically moving the pivots of the several levers. Each lever has an engagement with its particular actuating plate C by a slot and pin connection consisting of the slot c^4 in the plate and the pin i^2 in the lever. When the levers are in their normal position, the upper levers of the series are supported upon the lower lever, the pivoted end of each lever having a convex form i^3 resting in a concave seat i^4 formed in the upper end of the lever below. The upper end of each lever in front of the concave seat is provided with a cam i^5 , which, when the lever is forced inward by the action of the key and actuating plate, passes under the lower end of the lever above it and raises it, and all of the levers above it a distance equal to the elevation of the cam. Above the upper lever of the series is mounted a saddle J having its lower end formed like the lower end of each of the levers, so that it is raised when the uppermost lever is forced inward, in the same manner as the lower levers raise those above them. This saddle J has a vertical slidable connection with the partition wall, and is provided with means hereinafter to be described, whereby its movement in the ordinary operation of the machine is limited to the distance which one of the cams on the levers is adapted to elevate the lever above it. Thus, when one of the levers is forced inward, all of the levers above it and the saddle are lifted to the limit of movement allowed by the travel of the saddle, after which the movement of any other one of the levers is made impossible by the fact that all of the upward movement allowed to the

series by the limitation put upon the saddle is exhausted. It thus becomes impossible to operate more than one of the voting keys in each vertical candidate series. After a key has been voted, however, the voter may unvote that key and vote another key in the same series by simply drawing back the key, which permits the saddle and levers above the one drawn back to fall, leaving space for the inward movement of any other of the levers in the series that the voter may see fit to operate by the appropriate key. It will be readily seen that these levers I in each office column, taken together, constitute a distensible lock bar having sections (the levers) that are subject to actuators (the plates C) of the different party groups that go to make up that office column, each section being subject to one of the actuators in the office column group.

The means I employ for adjusting the vertical movement of the saddle J are preferably so constructed as to perform a double function, namely, to limit the movement of the saddle, and to carry over that movement and connect it with the next series, for multiple or multi-candidate voting, as in cases where there are two or more candidates to be elected for the same office, such as three judges or ten members of the legislature in cities, an additional or secondary vote-limiting mechanism is essential. In cases where there are four parties in the field and each has ten candidates for the State legislature, the machine must be constructed so as to permit the voter actuating any ten of the forty keys, and no more. In such a case, the keys for voting the forty candidates would be arranged in four horizontal series of ten each, and ten vertical series of four each. To accomplish this result, I employ the following mechanism, as shown in the rear view (Fig. 2), and in Figs. 4 and 5. The rear portion of the partition walls is cut away at a^5 , and the saddle J preferably mounted upon the top of the upper edge of the rear portion remaining. To the vertical side walls of the machine is attached a longitudinal bar or plate K extending the entire length of the machine. Upon the rear face of this plate K is supported a series of slidable levers M, one to each of the vertical series of levers I. The form and function of the levers M are quite similar to the form and function of the levers I, one being a vertical series and the other a horizontal series. There is this distinction, however: the levers I are adapted to be swung through only the one fixed unitary distance, whereas the levers M must be adapted to be swung or rotated through one or several unit distances, as may be required by the number of levers I in each office column. In constructing my machine, I form these levers M and support them in exactly the same

way for each vertical series, whether used in connection with keys for multiple voting or not, leaving the arrangement or adjustment of the levers for the purpose of multiple voting to the election officials, who will arrange them as the necessity of the particular election demands. By this means the same arrangement may be used throughout the entire system, either for the election of single candidates for office, or for the multiple system, and by my construction the keys for use in multiple voting can be selected from any part of the machine desired by the simple adjustment of these levers M and the location of the names of the candidates. These levers M are triangular in form, as shown, the pivot of the lever being at *m* in a horizontal slot in the plate K.

Where the lever is to be used in connection with the vertical levers I, for voting the single-candidate system, its function is merely to fix the position of the saddle J, in which case the lever M itself is fixed by means of the thumb screw *m'*, which, when set, enters a hole in the plate K and holds the lever M at two points, and therefore rigid. If the machine is to be used for single-candidate voting only, then each of the levers throughout the length of the machine will be thus fixed, thereby holding each of the saddles J in such a position of vertical adjustment as to allow but one of the vertical levers J to be operated and but one of the voting keys to be voted. This fixed position of the lever M is shown in full lines in Fig. 2. If, however, it is desired to use any part of the machine, or any number of the vertical series of keys, for multiple or multi-candidate voting, such of the levers M as are used in connection with the series selected will be released from their fixed position on the plate K by unsetting the thumb screw *m'*, thus leaving the levers so selected free to move up and down on their pivots *m*, within the limit of movement allowed to the levers. The position taken by the lever and saddle in this case is shown in dotted lines in Fig. 2. If there be ten candidates for each office, then ten of these levers would be so loosened. In addition to the oscillating or rotating movement allowed the levers, they have a limited slidable horizontal movement by reason of the fact that their pivots may slide loosely in the horizontal slots *k* in the plate K. The form of the angle of the levers is such that as the free end of it swings upward, the face *m²* of the lever will come in contact with the pivoted end *m³* of the lever next to it, and if the lever be carried upward after thus coming in contact with its neighbor, it forces such adjacent lever to move along in a horizontal direction. Thus, if there be ten candidates, the lever should be so adjusted that

one key of each of the ten vertical series could be operated and each of the levers M carried up one point without moving its neighbor, and if any one of the levers be carried up one or more points beyond its own one-point limit allowed to it, such movement will be carried on to the remaining series, and will reduce the number of keys that can be operated in the series in proportion. To adjust the lever so as to provide for the right number of points, I set the number of keys allowed to the whole series anywhere in the series, and then move the levers up into contact. Thus, if there be three regular parties each having ten candidates for the legislature to be voted for on the multiple system, if the voter desires to vote for the first man to the left in each of the list of candidates, he would operate the entire first vertical row of three keys to the left in that part of the machine devoted to multiple voting. This would carry the lever M above the series voted upward three points, one of which points would be allowed for before the lever would strike the pivoted end of the adjacent lever on the right, looking from the front of the machine; the other two points of elevation would then force this adjacent lever to the right a sufficient distance to take up the space of the two points, thus setting the machine so that only seven of the remaining twenty-seven keys could be operated, but these seven keys could be selected anywhere from the twenty-seven. The result would be the same if the voter set the three keys in the vertical row on the right of the bank, as the voting of them would move the lever M upward with the point in contact with the pivoted end of the fixed lever on the right, and the remaining two points of elevation would cause the lever itself to travel to the left a sufficient distance to take up two points of allowed space. If more than one key of an intermediate vertical series of three be voted, the lever M connected with the series would move either to the left or cause the others to move to the right, as the space remaining for the vote would allow. From the foregoing description, it is seen that the only change to be made in the machine to adjust it for multiple voting is to unset the thumb screw *m'* to release the levers to be employed, from their fixed position.

It will be readily seen that when this last described apparatus is arranged for multiple or multi-candidate voting, the levers M and their thumb screws *m'* constitute a secondary vote-limiting mechanism comprising a series of shiftable elements (the levers M) and stops (the thumb screws *m'*) for limiting the aggregate movements of the series of shiftable elements, and that the said shiftable elements (levers M) are subject one to

each of the distensible lock bars made up of the levers I, whereby the total number of votes which may be registered for a particular office is limited to the required number.

5 It will also be apparent that each of the levers M is a laterally-shiftable rotary element, rotated by its one of the distensible lock bars, as it is rotated by the action of its own lock bar, and shifted laterally by the

10 action of its own or the other lock bars, if the peculiar grouping of the keys selected necessitates such lateral shifting. It will, of course, be understood that I do not limit myself to the employment of this interlocking mechanism for four party rows, but con-

15 template employing as many as may be required.

To provide for voting a party ticket straight, I arrange a series of longitudinal

20 rock shafts N running the length of the machine, one for each party, and each having a tappet n fixed thereto adjacent to each key and actuating plate C. Each of these tappets rests normally against the shoulder

25 c^2 on the actuating plate C. This construction permits the key and actuating plate to be moved inward freely and away from the tappet; but when the rock shaft is given a partial revolution, carrying the entire series of tappets, each tappet acts against the

30 shoulder c^2 on the actuating plate C adjacent to it and moves the actuating plate inward in exactly the same manner as it would be moved if its key were pushed in alone.

35 As the rock shaft swings freely in its bearings, the voter can un-vote any one of the keys that he has voted with the entire party ticket, by drawing out such a key, as any of the single keys will return the rock shaft and

40 straight-ticket key to its normal position. Thus a voter, in voting a split ticket, can first vote his party ticket, and then vote such individual candidates for the same office put up by either of the other parties, or he can

45 vote an independent ticket, for which purpose suitable mechanism may be employed, as indicated by the slots a^6 , and the independent ballot feeding mechanism at p , p^6 and p^7 , in Fig. 1.

50 The front wall of the case is provided with removable sections A^3 , which fill the space between the vertical series of keys. These sections are engaged with the case by slipping the upper end of the section up

55 back of the horizontal strip a^8 , and the lower end is held to the case by the bar a^9 (see Fig. 4). This bar is pivoted at one end to the lower end of the removable sections, and provided near its front end with a cross-cut

60 channel which slips over a horizontal rod A^5 when the lower end of the bar is lowered. After the rear end of the bar is lowered, and the cross channel engaged with the rod, the bar is held down by the rear wall of the case,

65 which comes on top of it. This construction

is such that the removable sections can only be removed and the registering mechanism exposed for resetting by the removal of the rear wall of the case. I do not limit myself to this particular means for protecting the registering mechanism, but the same affords all the security necessary.

A^4 is a vertically sliding plate held to the removable sections A^3 by screws passing through slots a^{12} in the plate, the support

75 allowing the plate a limited vertical movement. The object of this plate is to form an interior cover for the openings a^{10} in the removable plates A^3 . These openings a^{10} come opposite to the registering wheels, and, when

80 opened, expose enough of the wheels to permit the vote to be taken off.

a^{11} are slots cut in the plate A^4 , and when these slots come opposite the openings a^{10} the vote of the registering wheels is unobstructed.

85 To provide for exposing all of the registering wheels at one time for the purpose of taking off the vote, I employ the horizontal slide T extending the entire length of the machine, and held to the front wall by a

90 slot and pin connection. Opposite each of the plate A^4 , this slide is provided with a diagonal slot t , which engages with the pin t' on the plate. This construction is such that the movement of the slide T endwise

95 causes each and all of the plates A^4 to move up and down to expose or cover the registering wheels.

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

100 state of the prior art.

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

1. In a voting machine, the combination

110 with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to

115 affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements, one for each column of primary elements, arranged and movable

120 transversely thereto and adapted to be moved thereby in proportion to the number of keys operated in its columns and to transmit movement to its associated elements when moved beyond a certain amount; connections be-

125 tween each of said secondary elements and its column of primary elements that permit the lateral movement of the secondary element without any movement of any portion of the primary column, and stops for the end

130

elements of the secondary series to thereby limit the total number of keys that may be operated.

2. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements, one for each column of primary elements, arranged and movable transversely thereto and adapted to be moved thereby in proportion to the number of keys operated in its column and to transmit movement to its associated elements when moved beyond a certain amount; connections between each of said secondary elements and its column of primary elements that permit the lateral movement of the secondary element without any movement of any portion of the primary column, stops for the end elements of the secondary series to thereby limit the total number of keys that may be operated, and means to detachably secure said interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

3. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements, one for each column of primary elements, arranged and movable transversely thereto and adapted to be moved thereby in proportion to the number of keys operated in its column and to transmit movement to its associated elements when moved beyond a certain amount; horizontal slot and pin connections between each of said secondary elements and its column of primary elements, and stops for the end elements of the secondary series to thereby limit the total number of keys that may be operated.

4. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements, one for each column of primary elements, arranged and movable transversely thereto and adapted

to be moved thereby in proportion to the number of keys operated in its column and to transmit movement to its associated elements when moved beyond a certain amount, horizontal slot and pin connections between each of said secondary elements and its column of primary elements, stops for the end elements of the secondary series to thereby limit the total number of keys that may be operated, and means to detachably secure said interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

5. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the secondary interlocking elements, one for each office column of keys and extending and movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column and to transmit its movement proportionally to the associated secondary interlocking element, connections between each of said secondary elements and its primary interlocking means that permit the lateral movement of the secondary element without any movement of any portion of the primary means, and stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated.

6. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the secondary interlocking elements, one for each office column of keys and extending and movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column, and to transmit its movement proportionally to the associated secondary interlocking element, connections between each of said secondary elements and its primary interlocking means that permit the lateral movement of the secondary element without any movement of any portion of the primary means, stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated, and means to detachably secure said secondary interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

7. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the secondary interlocking elements, one for each office column of keys and extending and movable

- transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column, and to transmit its movement proportionally to the associated secondary interlocking element, horizontal slot and pin connections between each of said secondary elements and its column of primary means, and stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated.
8. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the secondary interlocking elements, one for each office column of keys and extending and movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column and to transmit its movement proportionally to the associated secondary interlocking element, horizontal slot and pin connections between each of said secondary elements and its column of primary means, stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated, and means to detachably secure said secondary interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.
9. The combination of the levers, each having a slidable pivot on the frame, and a cam on one end adapted to move the adjacent lever when the lever provided with the cam is operated, substantially as described.
10. The combination of the levers, each having a slidable pivot on the frame, and a cam on one end adapted to move the adjacent lever when the lever provided with the cam is operated, and means for limiting the endwise movement of the levers to a predetermined number of points, substantially as described.
11. The combination of the levers, each having a slidable pivot on the frame, and a cam on one end adapted to move the adjacent lever when the lever provided with the cam is operated, and means for limiting the endwise movement of the levers to the distance the said levers are moved by the operation of a single lever, substantially as described.
12. The combination of the levers, each having a slidable pivot on the frame, and a cam on one end adapted to move the adjacent lever when the lever provided with the cam is operated, and the saddle for limiting the movement of the levers, substantially as described.
13. The combination of the keys arranged

in vertical series, with the vertical series of levers operated by said keys, means for raising the series of levers by the operation of a single lever in the series, a horizontal series of levers across the top only of the vertical series, and means for adjusting the last-named levers to limit the movement of the vertical levers to a predetermined number of points, substantially as described.

14. The combination of the levers arranged in three or more vertical series, with a horizontal series of levers of the third class one for each vertical series, adapted to interact in multi-candidate groups, and means for fixing each of the horizontal levers in position to limit the movement of its series of vertical levers to one point only.

15. The combination of three or more vertical series of levers, with means for extending each of the series lengthwise by the movement of the individual levers, means for limiting the points of movement allowed in a predetermined number three or more of the vertical series of levers, consisting of the series of horizontal levers across the top only of the vertical series arranged with a limited movement allowed to the whole number of levers and all adapted to interact in multicandidate groups, substantially as described.

16. The combination of the keys, with the vertical levers having a slidable engagement with the frame, and the horizontal levers having a horizontally slidable engagement with the frame and a pivoted engagement with said vertical levers, substantially as described.

17. The combination of the keys, with the vertical levers connected with the keys at one end, and having a slidable pivot in the frame at the opposite end, means for extending the levers by operating one of the keys and its connected lever, the horizontal levers having a pivot in the frame at one end and a limited movement at the other end, and means connecting the free end of the horizontal lever with the upper lever of the cooperating vertical series, substantially as described.

18. The combination of the several series of vertical keys, with means for carrying over from one vertical series to the others the number of keys operated in the series, said means consisting of a series of horizontal levers having a slidable pivot at one end, and a cam at the opposite end arranged to come in contact with the pivot end of the adjacent lever, and means for forcing up the free end of the lever a definite distance for every key operated in the vertical series, substantially as described.

19. The combination of a frame, with keys withdrawable at will slidable on said frame, a series of levers slidably pivoted to said frame and slidably pivoted to said keys, a

cam at the end of each lever adapted to raise the adjacent lever when operated by its key, and a saddle for limiting the number of keys that may remain in operated position.

20. In a voting machine, the combination with a face plate, of vertical partition walls, keys projecting through said plate and slidably supported by said partitions, a series of levers each having a slidable pivoted connection with a partition and a similar connection with a key, a cam at the end of each lever adapted to raise the adjacent lever when the key provided with the cam is operated, and means to limit the movement of the levers and the number of the keys in operated position.

21. In a voting machine, the combination of a face plate, with vertical partitions secured thereto, a plurality of series of keys projecting through said plate and slidably supported on said partitions for longitudinal movement, a plurality of series of levers, each having a slidable pivot in a partition and a slidable pivot connection with a key, a cam on the end of each lever adapted to raise the adjacent lever when the key of the lever provided with the cam is operated, and a horizontal series of levers to limit the movement of the vertical levers and the number of keys in operated position.

22. In a voting machine, the combination of keys arranged in vertical and horizontal series, with interlocking levers slidably pivoted to said keys also arranged in vertical and horizontal series, and a horizontal series of levers each so positioned as to limit the movement of the vertical levers to one step only.

23. In a voting machine, the combination of a group of keys arranged in a plurality of vertical and horizontal series, with a plurality of interlocking members slidably pivoted to said keys and arranged in vertical series, a horizontal series of interlocking members slidably pivoted to the upper members of each vertical series, and means for positioning said horizontal members and thereby predetermining the number of keys that may be operated simultaneously.

24. In a voting machine, a series of suitably connected single office units, each comprising a plate, voting mechanism slidably supported thereby, and limiting means slidably pivoted to said plates at their lower ends and to said voting members, and connecting means for the limiting mechanisms of the office units.

25. In a voting machine, the combination of a series of keys arranged in a plurality of vertical rows, and movable to operative and to normal positions at will, with interlocking members slidably pivoted to each key, a vertically slidable member at the upper end of each series, and pivoted members

slidably connected to said vertically movable members to control the number of keys simultaneously in operative position.

26. A voting machine composed of a series of segregable machine units, each comprising a plate and voting and limiting mechanism carried thereby, each unit devoted to a single office, and the plates of said units being suitably connected to form a wholly rigid structure or machine body therefor, means interconnecting and grouping the limiting mechanisms of said units comprising a vertically slidable member in each unit, and longitudinally slidable members pivotally connected thereto.

27. In a voting machine, the combination with several groups of registers and register actuators, assigned to different political parties but to the same office, of a plurality of distensible primary interlocking mechanisms having sections that are subject to one of the actuators of each group, and a secondary vote-limiting mechanism comprising a series of laterally-shiftable rotary elements, rotated one by each of said distensible primary interlocking mechanisms, and stops for limiting the shifting movement thereof, and thereby limiting the total number of votes which may be registered for the particular office.

28. In a voting machine, the combination with several groups of registers and register actuators, assigned to different political parties but to the same office, of a plurality of distensible primary interlocking mechanisms having sections that are subject to one of the actuators of each group, a secondary vote-limiting mechanism comprising a series of laterally-shiftable rotary elements, rotated one by each of said distensible primary interlocking mechanisms, stops for limiting the shifting movement thereof and thereby limiting the total number of votes which may be registered for the particular office, and means to detachably secure said rotary elements individually in the position to which they would be moved by the operation of a single actuator in that group.

29. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, a secondary vote-limiting mechanism comprising a series of laterally-shiftable rotary elements, rotated one by each of said columns of primary interlocking elements, and stops for limiting the shifting movement thereof and thereby limiting the total number of votes which may be registered for the particular office.

30. In a voting machine, the combination

with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, a secondary vote-limiting mechanism comprising a series of laterally-shiftable rotary elements, rotated one by each of said columns of primary interlocking elements, stops for limiting the shifting movement thereof and thereby limiting the total number of votes which may be registered for the particular office, and means to detachably secure said rotary elements individually in the position to which they would be moved by the operation of a single key in each of their associated columns.

31. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the laterally-shiftable rotary secondary interlocking elements, one for each office column of keys movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column and to transmit its movement proportionally to the associated secondary interlocking element, and stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated.

32. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the laterally-shiftable rotary secondary interlocking elements, one for each office column of keys movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column, and to transmit its movement proportionally to the associated secondary interlocking element, stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated, and means to detachably secure said secondary interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

33. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the second-

ary interlocking elements engaging each other directly, one for each column of primary elements, arranged and movable transversely thereto and adapted to be moved thereby in proportion to the number of keys operated in its column and to transmit movement to its associated elements when moved beyond a certain amount, and stops for the end elements of the secondary series to thereby limit the total number of keys that may be operated.

34. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements engaging each other directly, one for each column of primary elements, arranged and movable transversely thereto and adapted to be moved thereby in proportion to the number of keys operated in its column and to transmit movement to its associated elements when moved beyond a certain amount, stops for the end elements of the secondary series to thereby limit the total number of keys that may be operated, and means to detachably secure said secondary interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

35. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the secondary interlocking elements engaging each other directly, one for each office column of keys, and extending and movable transversely to the columns, primary interlocking means for each column of keys, extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column, and to transmit its movement proportionally to the associated secondary interlocking element, and stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated.

36. In a voting machine, the combination with the candidate keys arranged in party and office columns or rows, of the secondary interlocking elements engaging each other directly, one for each office column of keys, and extending and movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column, and to transmit its movement proportionally to the associated secondary in-

terlocking element, stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated, and means to detachably secure said secondary interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

37. In an interlocking mechanism for voting machines, a plurality of office rows of interlocking devices and voting keys, and a series of interlocking cam plates, one for each office row actuated by the operation of the voting keys, said plates each adapted to move independently and transversely of said office row interlocking devices, and having independent pivotal movement in proportion to the number of keys operated in any desired group of office rows.

38. In an interlocking mechanism for voting machines, a plurality of office rows of interlocking devices and voting keys, a plurality of independently and laterally movable and pivotally mounted cam plates, one for each office to be voted, and means for successively and progressively rocking and shifting laterally said cam plates consisting of a plurality of office groups of keys, one group for each cam plate.

39. In an interlocking mechanism for voting machines, a plurality of independently and laterally movable and pivotally mounted cam plates, one for each office to be voted, and means for successively and progressively rocking and shifting laterally said cam plates, consisting of a plurality of office groups of keys, one group for each cam plate, said cam plates contacting with each other and stops for limiting the rotation and lateral movement of the cam plates in proportion to the number of keys operated.

40. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements, one for each column of primary elements, arranged and movable transversely thereto and adapted to be moved thereby in proportion to the number of keys operated in its column and to transmit movement to its associated elements when moved beyond a certain amount; connections between each of said secondary elements and its column of primary elements that permit the lateral movement of the secondary element without any inevitable swinging movement of any portion thereof, and stops for the end elements of the secondary series to thereby limit the total number of keys that may be operated.

41. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements, one for each column of primary elements, arranged and movable transversely thereto and adapted to be moved thereby in the same direction in proportion to the number of keys operated in its column and to transmit movement transversely to its associated elements when moved beyond a certain amount, connections between each of said secondary elements and its column of primary elements that permit the lateral movement of the secondary element without any movement of any portion of the primary column, stops for the end elements of the second series to thereby limit the total number of keys that may be operated, and means to detachably secure said interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

42. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the secondary interlocking elements, one for each office column of keys and extending and movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column and to transmit its movement proportionally to the associated secondary interlocking element, connections between each of said secondary elements and its primary interlocking means that permit the lateral movement of the secondary element without any effective lengthening or shortening of said connections, and stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated.

43. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the secondary interlocking elements, one for each office column of keys and extending and movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column, and to transmit its movement proportionally to the associated secondary interlocking element, connections between each of said secondary elements and its primary interlocking means that permit the lateral movement of the secondary ele-

ment without any effective lengthening or shortening of said connections, stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated, and means to detachably secure said secondary interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

44. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements engaging each other directly, one for each column of primary elements, arranged and movable transversely thereto and adapted to be moved thereby in the same direction in proportion to the number of keys operated in its column and to transmit movement transversely to its associated elements when moved beyond a certain amount, and stops for the end elements of the secondary series to thereby limit the total number of keys that may be operated.

45. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the primary interlocking elements arranged in corresponding office columns or rows and adapted to be moved by the operation of the keys to affect the length of the columns of interlocking elements according to the number of keys operated in each column, the secondary interlocking elements engaging each other directly, one for each column of primary elements, arranged and movable transversely thereto and adapted to be moved thereby in the same direction in proportion to the number of keys operated in its column and to transmit movement transversely to its associated elements when moved beyond a certain amount, stops for the end elements of the secondary series to thereby limit the total number of keys that may be operated, and

means to detachably secure said secondary interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

46. In a voting machine, the combination with the candidate keys arranged in party and office rows and columns, of the secondary interlocking elements engaging each other directly, one for each office column of keys, and extending and movable transversely to the columns, primary interlocking means for each column of keys, extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column, and to transmit its movement proportionally in the same direction to the associated secondary interlocking element, and stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated.

47. In a voting machine, the combination with the candidate keys arranged in party and office columns or rows, of the secondary interlocking elements engaging each other directly, one for each office column of keys, and extending and movable transversely to the columns, primary interlocking means for each column of keys extending parallel thereto and adapted to be moved thereby according to the number of keys simultaneously in operative position in the office column, and to transmit its movement proportionally in the same direction to the associated secondary interlocking element, stops for the end secondary interlocking elements so as to limit the total number of keys that may be simultaneously operated, and means to detachably secure said secondary interlocking elements individually in the position to which they would be moved by the operation of a single key in that column.

In testimony whereof, I sign this specification in the presence of two witnesses.

CHARLES A. BENKE.

Witnesses:

S. E. THOMAS,
IRENE GILBERT.