July 7, 1942. C. K. MOORE 2,289,033

VOTING MACHINE

Filed July 19, 1937 6 Sheets-Sheet 1

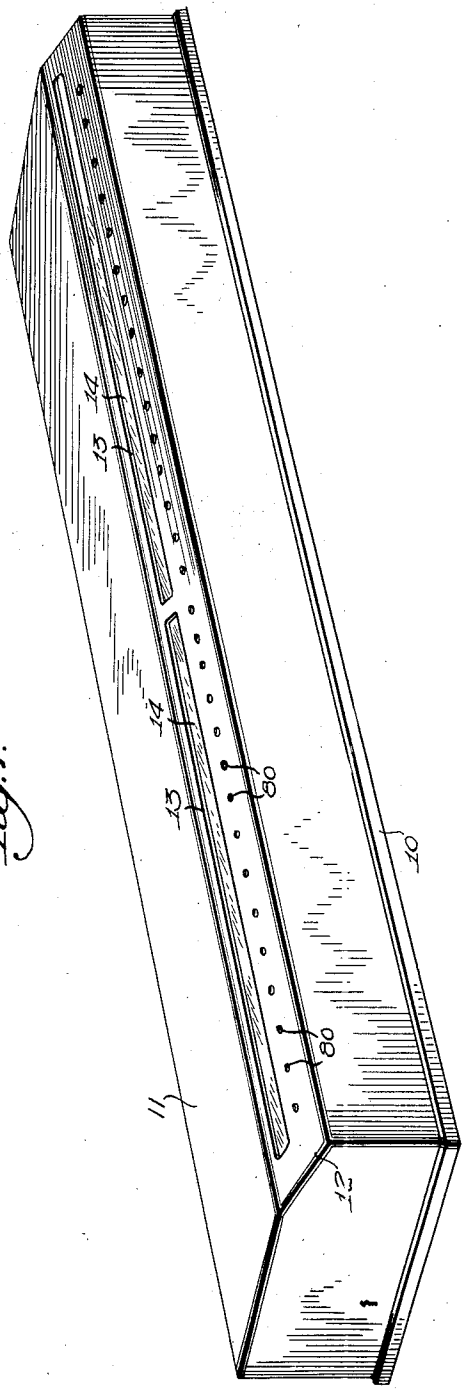


Fig. 1.

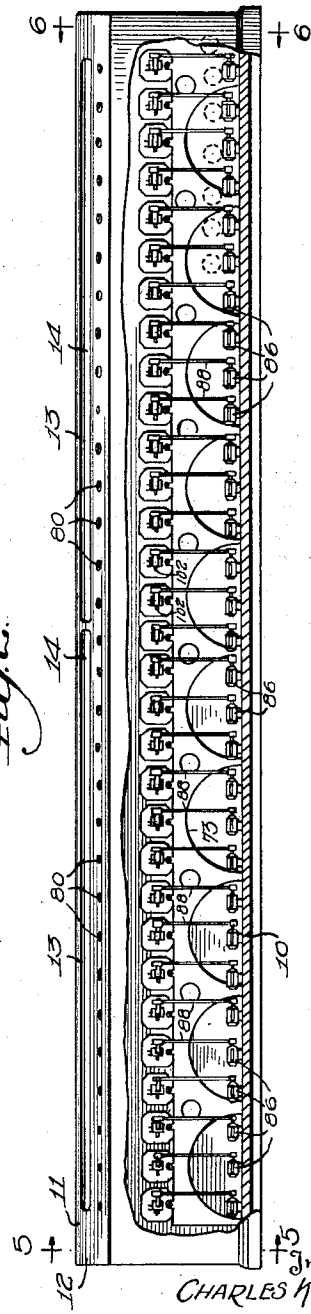


Fig. 2.

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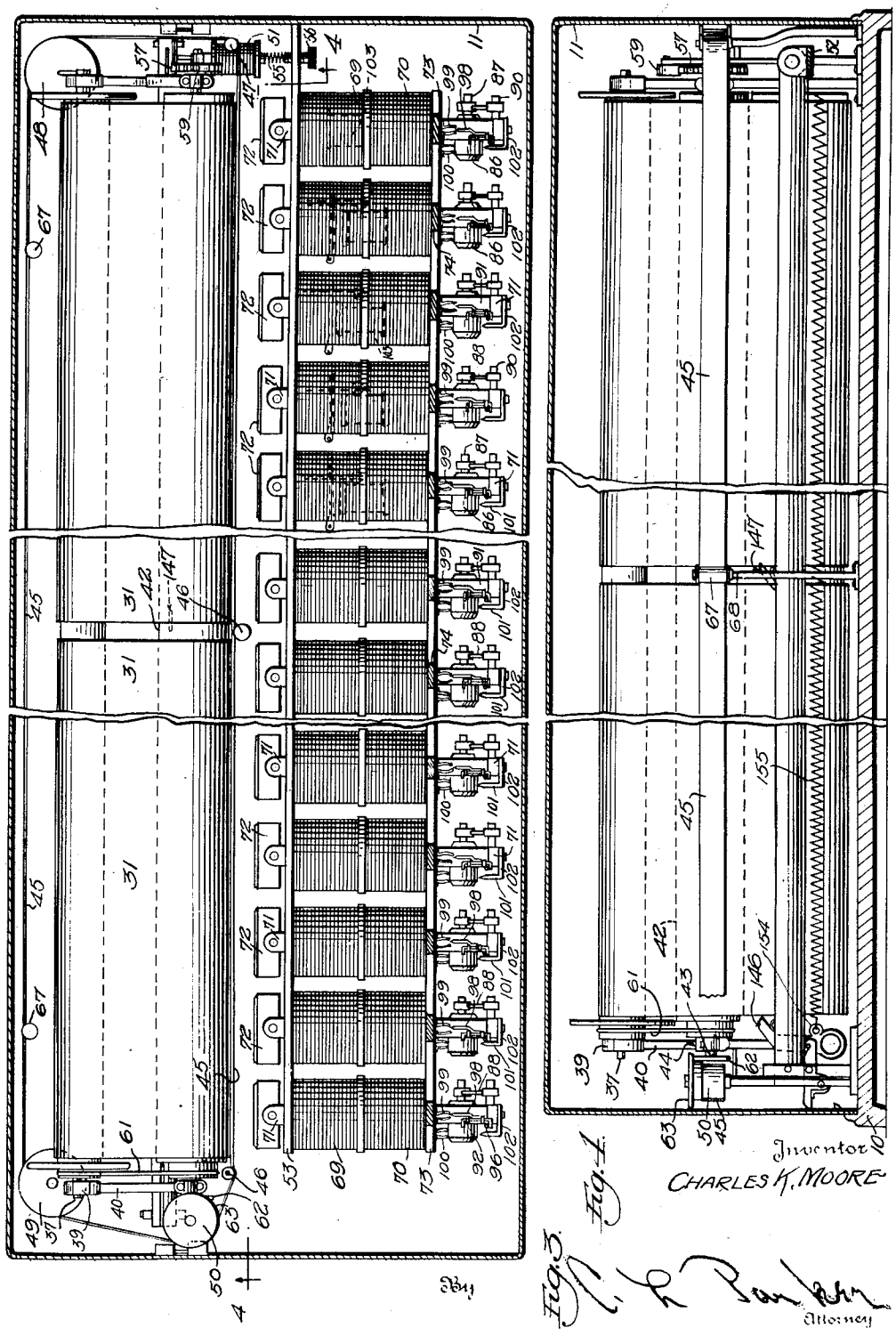


Fig. 3.

Fig. 4.

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Fig. 5.

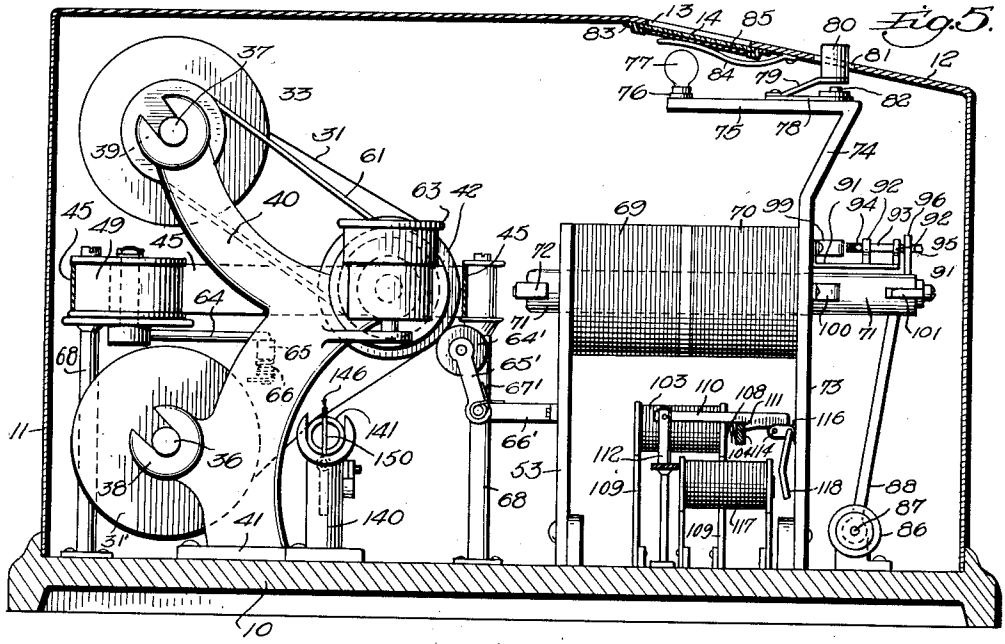
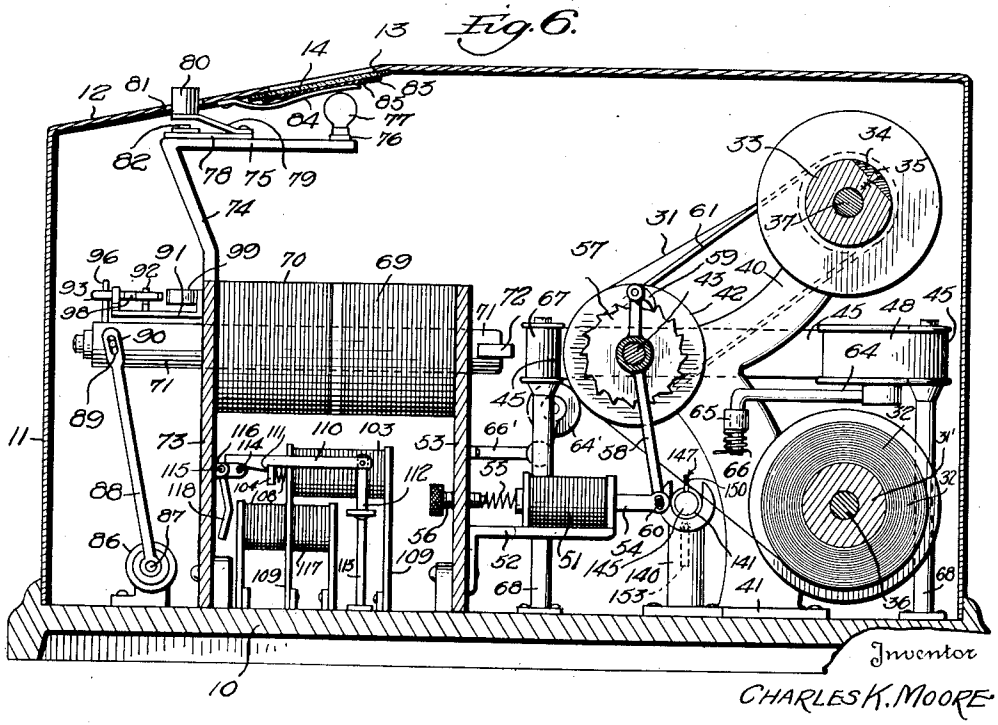


Fig. 6.



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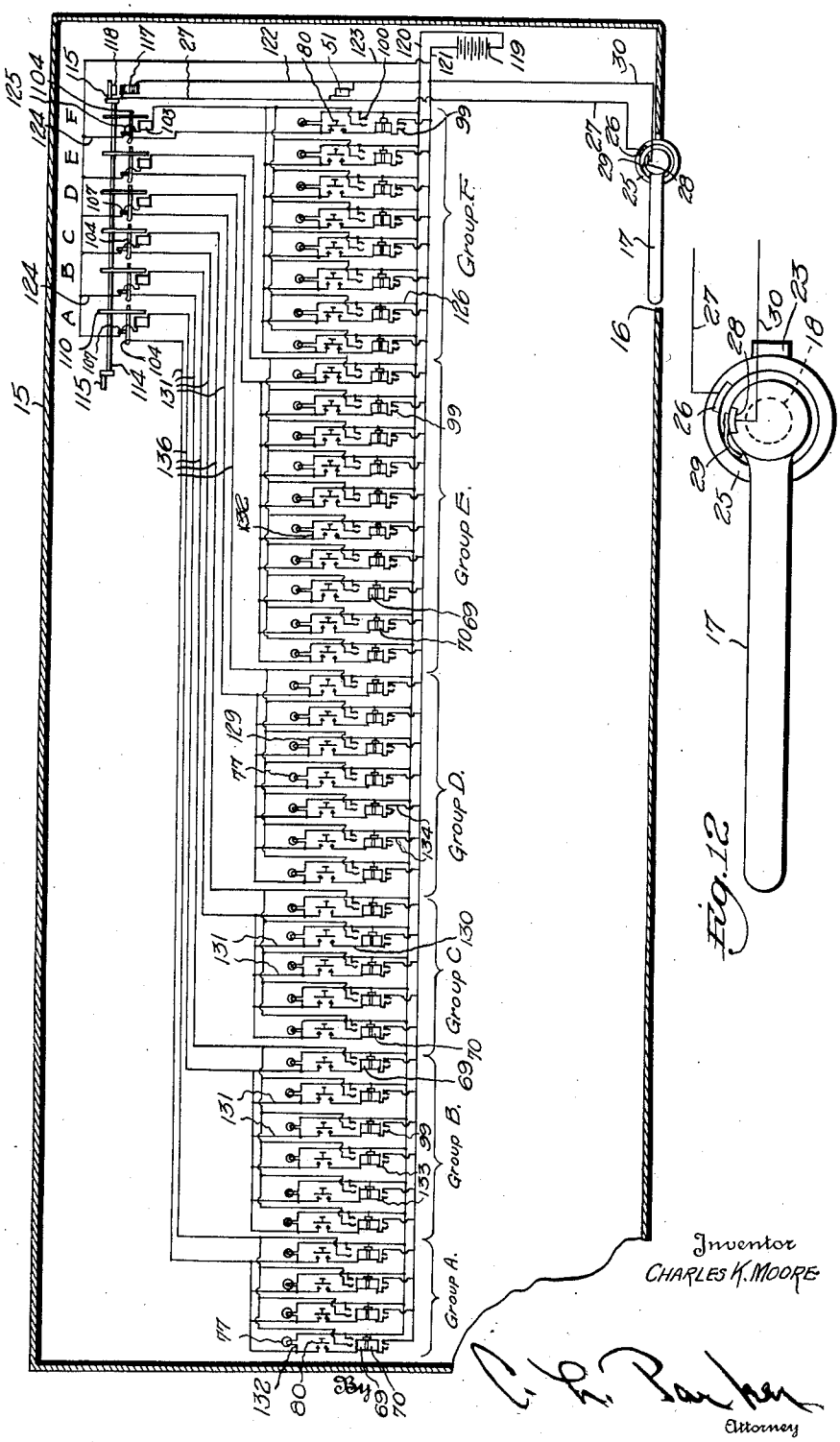


Fig. 7.

Fig. 12

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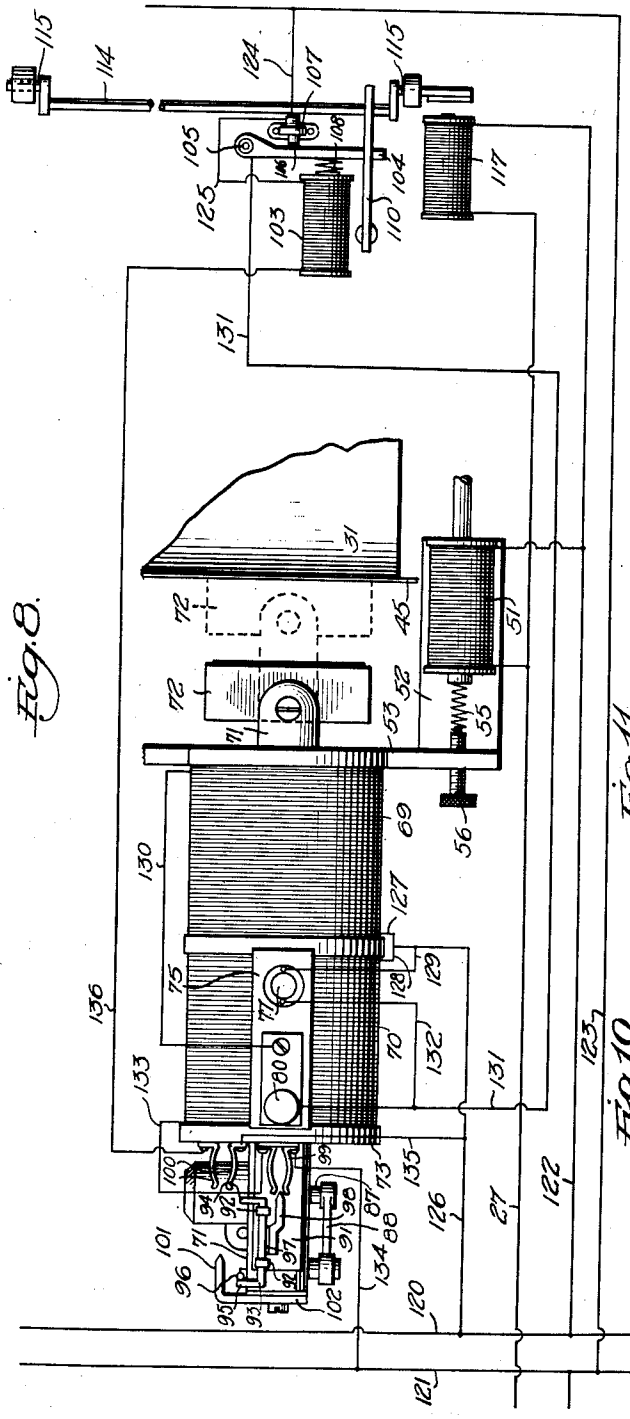


Fig. 8.

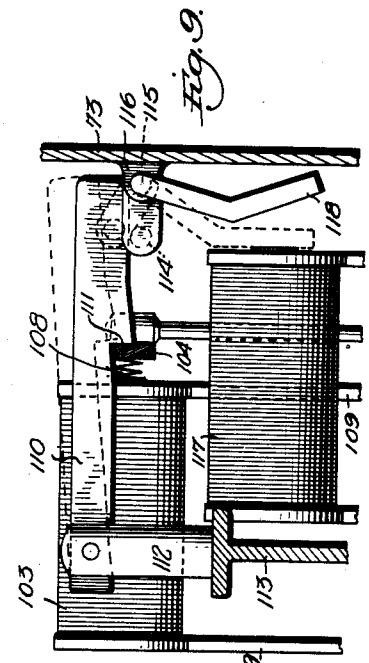


Fig. 9.

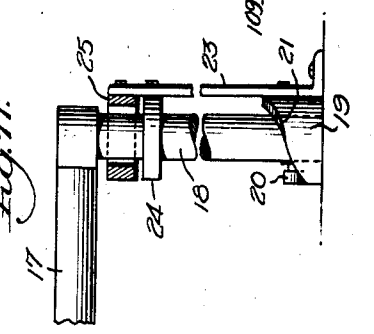


Fig. 11.

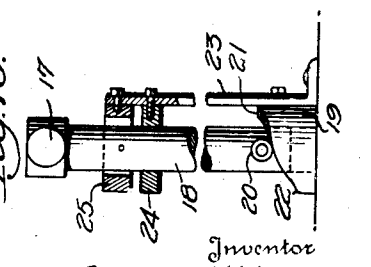


Fig. 10.

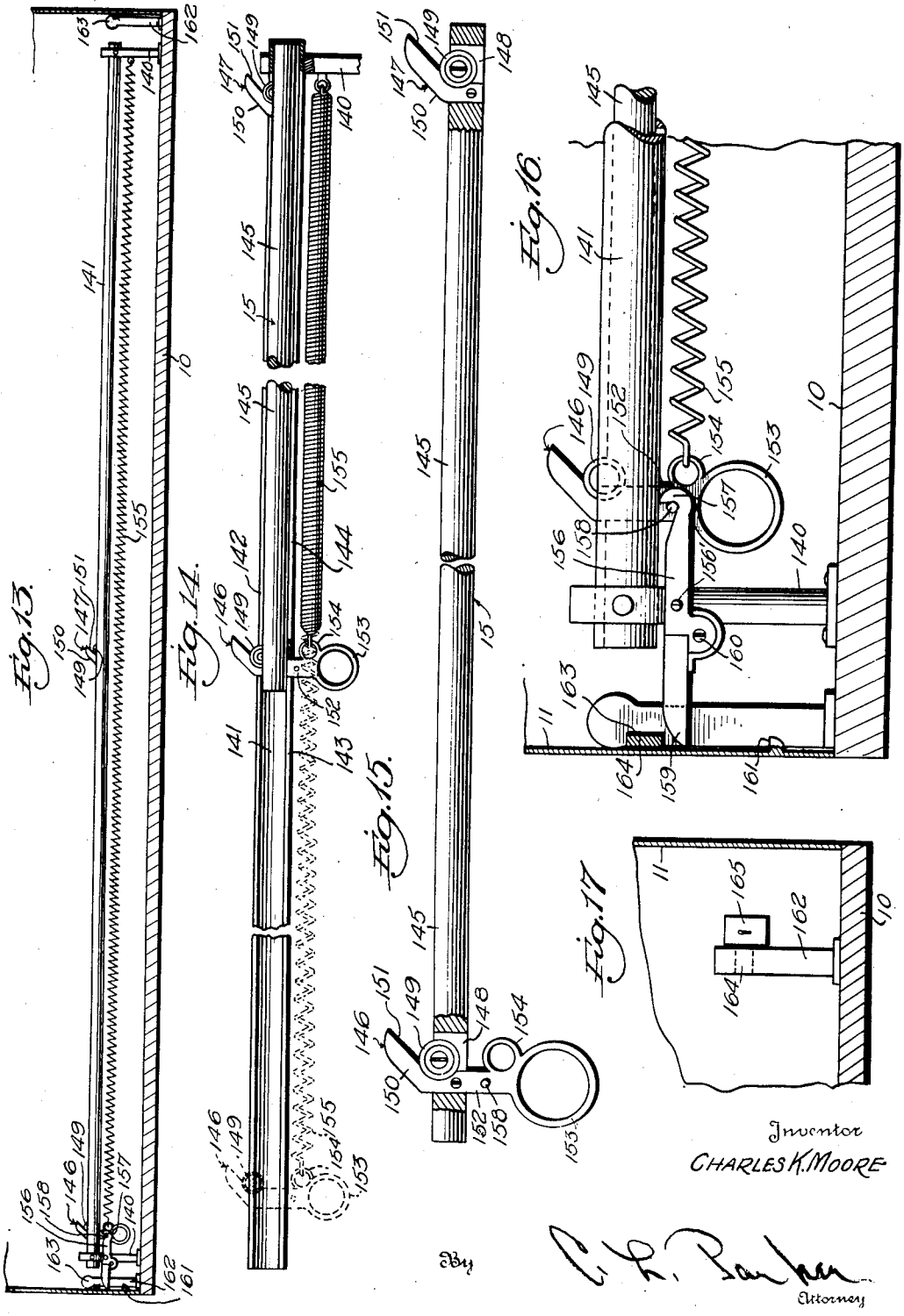
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VOTING MACHINE

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UNITED STATES PATENT OFFICE

2,289,033

VOTING MACHINE

Charles K. Moore, Brownwood, Tex.

Application July 19, 1937, Serial No. 154,500

13 Claims. (Cl. 235—50)

This invention relates to electrical voting machines.

An important object of the invention is to provide a voting machine wherein a vote for any office may be cast merely by pressing a button and wherein duplication in voting for a given office is positively prevented.

A further object is to provide a voting machine having a plurality of individual voting units divided into groups according to the various offices to be voted for, and to provide each group with a master control means rendering it completely inoperative upon the casting of one vote, thereby preventing fraudulent duplication in voting.

A further object is to provide each group of voting units with a master control switch for the purpose stated, and to provide novel means for closing the master control switches to render all of the voting units operative upon the entrance of a voter into the voting booth.

A further object is to provide a voting machine of the character referred to wherein the master control switches are respectively the armatures of master solenoids, each of which is energized upon the operation of any voting unit of its group, thereby attracting the armature forming the master switch of such group to prevent further voting.

A further object is to provide an apparatus of this character wherein a single operating means is controlled by the entrance of a voter into the voting booth for rendering all of the master switches operative to permit the voter to cast a vote in each of the voting groups.

A further object is to provide an electrically controlled printing means for recording the votes in the various voting groups, wherein endless paper sheets are progressively wound upon collecting spools as the voting progresses.

A further object is to provide such an apparatus wherein the names of the various candidates, or other indicia, are typed upon the paper strips through typewriter or similar ribbons, and wherein automatic means is provided for advancing the paper strips in a step by step movement as the voting progresses.

A further object is to provide such an apparatus wherein the paper strip advancing means simultaneously operates to advance the typing ribbon in a similar step by step movement.

A further object is to provide a paper and type ribbon control apparatus of the character referred to wherein each step by step actuation takes place automatically upon the operation of the gate or door through which the voters enter and leave the voting booth.

A further object is to provide a novel type of voting unit in conjunction with its master control means, wherein the pressing of a button or the closing of a similar switch energizes electromagnetic means to print on the paper strip the name of the candidate voted for, and wherein, upon completion of the printing operation, the parts are restored to normal position simultaneously with the operation of the master control means for rendering the voting group inoperative.

A further object is to provide each voting unit with a light illuminating the name of the candidate represented by the unit, together with means operative upon the entrance of a voter into the booth for simultaneously operating all of the lights to illuminate the names of all of the candidates for the various offices.

A further object is to provide such an apparatus wherein means are provided for opening all of the circuits through the lights of a voting group immediately upon the casting of a vote through the operation of one of the units of the group.

A further object is to provide each voting unit with a counter automatically operated upon the casting of a vote, whereby the total number of votes for each candidate may be quickly and readily determined upon the closing of the voting.

A further object is to provide novel means for cutting or severing the paper strip between the supply roll and the collecting roll upon the completion of the voting.

A further object is to provide cutting means of the character referred to which is automatically operable upon the removal of the cover of the voting machine, thus automatically closing the election upon the removal of the cover and preventing any fraudulent continuation of the voting.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings I have shown one embodiment of the invention. In this showing:

Figure 1 is a perspective view of the machine,

Figure 2 is a front elevation of the same, a portion of the casing being broken away to indicate the positions of the voting units,

Figure 3 is a plan view of the mechanism of the machine as a whole, the casing being shown in elevation and parts being broken away,

Figure 4 is a longitudinal vertical sectional view taken substantially on line 4—4 of Figure 3,

Figure 5 is a transverse vertical sectional view adjacent one end of the apparatus, taken substantially on the line 5—5 of Figure 2,

Figure 6 is a similar view taken through the opposite end of the apparatus, substantially on line 6—6 of Figure 2,

Figure 7 is a diagrammatic view of the apparatus within a voting booth, showing the electrical system for the apparatus,

Figure 8 is a plan view of one of the voting units and associated elements at the right hand end of the machine as shown in Figure 7, showing the electrical system therefor and its connection with its associated master control switch machanism and the operating mechanism for the latter,

Figure 9 is a detail sectional view showing one of the master control devices and the operating mechanism therefor,

Figure 10 is a vertical sectional view showing the gate and supporting means therefor, the gate being shown in open position and parts being shown in elevation,

Figure 11 is a similar view showing the gate in closed position,

Figure 12 is a plan view of the gate showing the electrical connections therefor,

Figure 13 is an elevation of the paper cutting mechanism, portions of the base and casing of the apparatus being shown in section,

Figure 14 is an enlarged sectional view of the cutter supporting tube and associated elements, parts being shown in elevation and parts being broken away,

Figure 15 is an elevation of the paper cutters and the supporting bar therefor, parts being shown in section,

Figure 16 is an enlarged fragmentary sectional view through one end of the apparatus showing the paper cutting means and casing locking means, parts being shown in elevation,

Figure 17 is a detail view of one of the casing locking mechanisms.

Referring to Figures 1 and 2, the numeral 10 designates the base of the apparatus, which supports all of the working parts thereof, as will become apparent. Such working parts are covered by means of a casing 11, the vertical walls of which are supported at their lower edges on the base 10. In a manner to be described, the casing 11 is locked in position on the base 10 to prevent any tampering with the mechanism. The casing 11 is provided with a sloping wall 12, and this wall is provided with suitable openings or windows through which the illuminated names of the candidates and the offices for which they are running may be viewed by the voter. In the embodiment of the invention illustrated, the wall 12 is provided with two elongated openings 13 arranged in end to end relation and closed by glass windows 14, supported in position in a manner to be described.

Referring to Figure 7, it will be noted that the apparatus is arranged within a voting booth indicated as a whole by the numeral 15, and it will be apparent that this booth may be of any desired type. The passageway 16 of the booth is closed by a gate 17, which is swung inwardly upon the entrance of a voter into the booth and outwardly when the voter leaves the booth. The supporting means and the electrical connections operated by the gate are of the types shown in Figures 10, 11 and 12. The bar of the gate is supported at one end by a vertical shaft 18 having its lower end arranged in a bearing 19. The shaft 18 is provided with a roller 20 operating over a cam 21 so designed that the roller 20 is at the low point 22 of the cam, when in closed position. Obviously, therefore, the gate 17 gravitates to its closed position.

A vertical bracket 23 extends upwardly from the bearing 19 and carries a second bearing 24 for the shaft 18. Above the bearing 24, the bracket 23 supports a ring 25 formed of insulating material, and this ring is provided with a contact 26 to which is connected a wire 27 (Figures 7 and 12). The shaft 18 carries an insulating member 28 to which is attached a spring contact member or brush 29. A wire 30 is connected to the brush 29, and this brush normally is out of engagement with the contact 26, as shown in Figure 12. When a voter enters the booth, the gate 17 is swung in a clockwise direction, as viewed in Figures 7 and 12, in which case the brush 29 engages the contact 26 to close two magnetic circuits to be referred to, the closing of these circuits preparing the apparatus for operation. As will become apparent, the circuit across the wires 27 and 30 need be completed only momentarily. This circuit is completed when a voter enters the booth, whereupon the gate 17 returns to normal position. When the voter leaves the booth, the gate 17 turns in a counter-clockwise direction, as viewed in Figures 7 and 12, and this operation obviously moves the brush 29 away from the contact 26, and accordingly has no effect on the circuits controlled by the wires 27 and 30.

The apparatus to be described prints a record of each individual vote on suitable paper stripping provided for such purpose. As a practical matter, it is preferred to provide two separate paper strips 31 (Figures 5 and 6) wound as at 32 on supply spools 31'. The printed paper strips are collected on record spools 33 each of which has a separable section 34 secured as at 35 to the body of the spool and adapted to receive the end of the paper strip therebeneath to insure the positive winding thereof. The spools 31' and 33 are respectively mounted on shafts 36 and 37. The ends of these shafts are respectively supported in the bearings 38 and 39 of bearings brackets 40, the bases 41 of which (Figures 5 and 6) are secured to the base 10. A single spool 31' and a single spool 33 may be employed for winding the two paper strips, the adjacent edges of these strips being supported as shown in Figure 3 for a purpose to be described.

From the supply spool 31', the paper strips pass upwardly and forwardly at an angle around a platen 42 mounted on a shaft 43, and the ends of this shaft are supported in bearings 44 carried by the brackets 40. A typewriter ribbon or similar element 45 passes along the platen 42 forwardly thereof as shown in Figures 3 and 5. This ribbon is preferably endless and advances along the platen in a step by step movement by means to be described. The ribbon passes around idler rollers 46 and 47 adjacent opposite ends of the platen 42. Rearwardly of the apparatus, the ribbon passes around rollers 48 and 49. Adjacent one end of the platen, the ribbon passes around a driving roller 50 to which motion is imparted in a manner to be described to provide the step by step movement of the ribbon. The same source of power is employed for advancing the paper strips and for advancing the ribbon,

and such source of power preferably is in the form of an electro-magnet energized upon the opening of the gate 17.

Referring to Figure 6, the numeral 51 designates a solenoid supported in a suitable angle bracket 52, and this bracket in turn, is secured to a vertical bracket 53 extending longitudinally of the apparatus, as shown in Figure 3. The bracket 53 forms one of the supporting elements for the voting units to be described. The solenoid 51 is arranged adjacent one end of the apparatus, such as the right hand end as viewed in Figure 3. An armature 54 is provided for the solenoid 51 and a spring 55 urges the armature to the position shown in Figure 6. A screw 56, threaded in the bracket 53, limits the movement of the armature 54 upon energization of the solenoid 51.

One end of the platen 42 is provided with a ratchet wheel 57. A lever 58 is pivoted upon the shaft 43 and carries a pawl 59 engageable with the teeth of the ratchet wheel 57. The other end of the lever 58 is connected as at 60 to the end of the armature 54. This connection, of course, may be sufficiently loose to compensate for the slightly arcuate path of movement of the lower end of the lever 58 without causing the armature 54 to bind within the core of the solenoid. Upon each opening of the gate 17, the solenoid 51 is energized, whereupon the armature 54 moves to advance the platen one step, thus moving the paper strip the proper distance between lines of printing thereon.

Referring to Figures 3, 5 and 6, it will be noted that the platen 42 and spool 33 are connected by an endless drive member 61, and the step by step movement of the platen is thus imparted to the spool 33 to wind the paper strips thereon. The endless member 61 is adapted to slip on the spool 33 as the paper collects thereon, thus compensating for the progressively increasing diameter of the paper strips on the spool 33.

As previously stated, the endless ribbon 45 passes around the roller 50, and the same source of power is employed for advancing the paper strip and for advancing the ribbon. As shown in Figures 3 and 4, the shaft 43 is provided with a friction drive member 62 engageable beneath an outstanding flange 63 carried by the roller 50. Accordingly it will be apparent that each step by step movement of the platen transmits similar movement to the roller 50 to advance the ribbon 45. Of course, the ribbon 45 is preferably slightly tensioned to maintain it in a taut condition, and for this purpose, the rollers 48 and 49 are preferably mounted on swinging arms 64 (Figure 6). The arms may have down turned ends supported in small bearings 65 carried by the brackets 40, and torsion springs 66 tend to turn the arms 64 to maintain the ribbon in a taut condition.

The mechanism referred to keeps the ribbon relatively tightly stretched and in proper frictional engagement with the roller 50 to be advanced step by step in the manner described. Such means also tends to maintain the ribbon in proper position between the rollers 47 and between the rollers 48 and 49. If desired, additional small idler rollers 67 may be provided in the forward and rear runs of the ribbon, and such rollers may be supported in any suitable manner, as by means of posts 68.

Means may be provided for assisting in maintaining the paper strips 31 in snug engagement with the platen. Such means is preferably in the form of a roller or rollers 64', carried by arms 65' pivotally connected to brackets 66', and these brackets may be supported by the brackets 53 previously described. Torsion springs 67' are adapted to turn the arms 65' in a counter-clockwise direction as viewed in Figure 5, to maintain the roller or rollers 64' snugly against the paper passing around the platen.

The apparatus is provided with a plurality of voting units, a sufficient number of units being employed in each machine to provide one unit for each candidate for all of the offices to be voted upon. As will be referred to later, these units are electrically divided into groups, each group containing units corresponding to the candidates running for a given office. For example, in a State election, one voting group may contain a unit for each of the candidates for Governor, another group may contain a unit for each candidate for Lieut. Governor, etc. The voting units have been illustrated in detail in Figures 3, 5, 6 and 8.

The various voting units are identical with each other, and only one need be described in detail. Each unit comprises a double solenoid formed of individual solenoids 69 and 70 arranged in end to end relation and provided with a common armature 71. At its inner end, each armature is provided with a type bar 72 carrying the name of the candidate represented by the corresponding voting unit. Upon energization of the solenoid 69 in a manner to be described, the type bar strikes the ribbon 45 and thus prints the name of the candidate upon one of the paper strips. Upon subsequent energization of the solenoid 70, the armature 71 will be restored to its normal position, as illustrated.

The double solenoids of the various units are supported at their rear ends by the bracket 53, previously described, this bracket extending throughout the greater portion of the length of the apparatus as shown in Figure 3. A somewhat similar forward bracket 73 supports the forward extremities of the double solenoids. Both of these solenoid supporting brackets are supported on the base 10, as shown in Figure 6. The bracket 73, above the associated solenoid 70, is provided with an extension 74, the upper end of which turns rearwardly to form a horizontal supporting bracket 75. This bracket carries an insulating member 76 supporting a light bulb 77. The bracket 75 also supports an insulating strip 78 which carries a spring arm 79 having a push button 80 secured to the free end thereof and extending through an opening 81 in the sloping wall 12 of the casing. The push button 80, upon being depressed, engages a contact 82, supported by the insulating strip 78.

As previously stated, the wall 12 of the casing is provided with openings 13 having window glasses 14 therebeneath. One edge of each of the glasses 14 is mounted on a supporting strip 83 (Figure 6) and the body of the glass is supported by spring clips 84 secured against the bottom of the wall 12. Beneath each glass 14, and also supported by the clips 84, is a translucent strip 85 upon which is printed the names of the various candidates for office. Each candidate's name is arranged above one of the buttons 80 and is illuminated by the corresponding light 77. As will be described, the pressing of the button 80 registers a vote for the corresponding candidate, whereupon the entire group of voting units, that is, the group containing the names of candidates for the same office is rendered inoperative and

the corresponding lights 77 simultaneously have their circuits broken.

A counter 86 is provided for each voting unit. Each counter has a rock shaft 87 to which is connected the lower end of an arm 88, and the upper end of this arm is slotted as at 89 to receive a pin 90 carried by the corresponding armature 71. Obviously each counter adds one to its total of votes upon each actuation of the armature 71.

Above each armature 71, the bracket 73 is provided with a small horizontally extending bracket 91 (Figures 5, 6 and 8) and this bracket carries a pair of guides 92 in which is slidable a bar 93, preferably square in cross-section to permit it to slide without rocking. This bar is provided at its ends with outstanding fingers 94 and 95 engageable by an upwardly extending finger 96 carried by the armature 71 adjacent its extremity. It will be apparent that movement of the solenoid armature causes the finger 96 to engage the finger 94 upon energization of the solenoid 69, while energization of the solenoid 70 causes the finger 96 to engage the finger 95. This structure provides a lost motion operation whereby the bar 93 is actuated only near the ends of the stroke of the armature, for a purpose to be described.

The bar 93 is provided with an insulating strip 97 to which is connected a contact 98, and near the end of the operating stroke of the armature, the contact 98 is driven between spring contacts 99. The contacts 99 may be supported by the vertical portion of the bracket 91. A similar pair of spring contacts 100 is supported at one side of the armature 71 (Figures 5 and 8) and these contacts are engageable by a contact 101 having a laterally turned end 102 secured to the extremity of the armature 71. As will become apparent, engagement of the contact 101 with the spring contacts 100 breaks the circuits through the solenoid 69, light 77 and push button 80, while engagement of the contact 98 with the spring contacts 99 closes a circuit through the solenoid 70 to return the armature 71 to its normal position. The finger 96 engages the finger 94 near the end of the operating stroke of the armature 71 to close the circuit across the contacts 99. After energization of the solenoid 70, the finger 96 engages the finger 95 near the end of the return movement of the armature to disengage the contact 98 from the spring contacts 99.

As previously stated, the individual voting units are electrically grouped together in accordance with the offices being voted upon. As shown in Figure 7, for example, the voting units may be made up of groups A, B, C, D, E and F, each group comprising voting units for a given office, such as Governer, Lieut. Governor, State's Attorney, etc. As also previously stated, each group is provided with a master control mechanism whereby all of the units of each group may be rendered operative upon the entrance of a voter into the booth and whereby the units of each group may be simultaneously rendered inoperative upon the casting of one vote by operating any unit of the group. The master control mechanisms have been diagrammatically illustrated in the upper right hand corner of Figure 7 and have been lettered to correspond to the designations of the groups of voting units in the same figure of the drawings. The electrical connections for one of the master control mechanisms are shown in detail in Figure 8, and the structures of such mechanisms will be clear from the mechanical disclosures in Figures 5, 6 and 9.

Each master control mechanism comprises an electro-magnet 103 having an armature 104 pivotally supported at one end as at 105. Each armature carries a contact 106 engageable with a stationary contact 107, and a spring 108 urges each armature to the position shown in Figure 8 with the contact 106 engaging the contact 107. The solenoids 103 may be supported in any suitable manner, and have been shown in Figures 5 and 6 as being supported by upstanding brackets 109 having their lower ends secured to the base 10.

Each master control mechanism further comprises a pivoted latch bar 110 having a latch finger 111 engageable with the corresponding armature 104 to latch it inwardly toward its magnet 103 with the contact 106 disengaged from the contact 107. The latch bars 110 may be pivotally connected to posts 112 arranged on a support 113.

Referring to Figures 5, 6, 7 and 9, the numeral 114 designates a bar having offset ends 115 supported in bearing lugs 116 which may be carried by the bracket 73. As shown in Figure 6, the bar 114 obviously is eccentric with respect to the offset ends 115, and extends beneath the free ends of the latch bars 110. Upon the rocking of the bar 114 about the axis of the extensions 115, it will be apparent that the latch bars will be simultaneously lifted to release all of the armatures 104. This operation is accomplished by energization of an electro-magnet 117 having an armature 118 depending from one of the offset ends 115 of the bar 114, as clearly shown in Figure 9. The electro-magnet 117 is energized in the manner to be described upon the entrance of a voter into the booth 15.

The wiring system for the apparatus is shown in Figures 7 and 8, the latter figure showing the wiring connections for one of the voting units and its associated master control mechanism. Referring to Figure 7, the numeral 119 designates the source of current having opposite terminals connected respectively to a pair of main feed wires 120 and 121 shown as extending along all of the voting units of the various groups. The wire 30, previously described, is tapped into the wire 121 while the wire 27 is connected to one terminal of the platen and ribbon operating solenoid 51. The other terminal of the magnet 51 is connected to a wire 122 tapped into the feed wire 120, as shown in Figure 7, and the wires 27 and 122 lead to the respective terminals of the magnet 117. With the circuit thus described, it will be obvious that the opening of the gate 17 energizes the solenoid 51 to operate the step by step mechanism for advancing the platen and ribbon. Since the magnet 117 is connected in parallel with the solenoid 51, it will be apparent that the magnet 117 will be simultaneously operated, and this operation results in the unlatching of all of the latch bars 110 to release the master control switches 104.

A wire 123 (Figures 7 and 8) is connected at one end to the wire 121 and branch wires 124 are connected between this wire and the contacts 107 of the several master switch units. From each of the contacts 107, a wire 125 leads to one terminal of the corresponding magnet 103, as more clearly shown in Figure 8. As previously stated, the opening of the gate 17 releases all of the master switch arms 104, and upon the operation of a voting unit in any of the groups referred to, the

corresponding magnet 103 will be energized to attract its armature, namely, the switch arm 104, and under such conditions, all of the voting units of such group will be rendered inoperative, as will be shown.

The wiring connections for one of the voting units is shown in detail in Figure 8. A wire 126 is connected at one end to the feed wire 120, and is branched as at 127 and 128 for connection with one terminal of each of the respective solenoids 69 and 70. A wire 129 is connected between the wire 126 and one terminal of the light bulb 77. A wire 130 is connected between the second terminal of the solenoid 69 and one contact of the push button 80, the other contact of this button being connected by a wire 131 to the master switch arm 104 which controls the group of voting units of which the unit shown in Figure 8 is a part, the wire 131 being branched for connection to the various buttons 80, as shown in Figure 7. The second terminal of the light bulb 77 is connected to the wire 131 by a wire 132, and accordingly it will be apparent that the push button 80 is in series with the solenoid 69 and in parallel with the light bulb 77.

The second terminal of the solenoid 70 is connected by a wire 133 to one of the clips 99, and a wire 134 is connected between the other clip 99 and the feed wire 121. Accordingly it will be apparent that the circuits for the two solenoids 69 and 70 of each unit are connected in parallel, energization of the solenoid 69 being dependent upon the operation of the push button 80, and energization of the solenoid 70 being dependent upon the closing of the circuit across the clips 99 by the jack switch 98.

A wire 135 is tapped into the wire 126 and leads to one of the clips 100. The other clip 100 is connected by a wire 136 to the second terminal of the magnet 103, the wire 136 being branched for connection to one of the clips 100 of each voting unit as shown in Figure 7. Accordingly the closing of the circuit across the clips 100 by the jack switch 101 under conditions to be described energizes the magnet 103, thus attracting its armature 104. This operation breaks engagement between the contacts 106 and 107, which operation, as will be described, renders inoperative all of the units of the group controlled by the corresponding switch 104.

The apparatus described is operative for providing quick and efficient voting while eliminating any chance of fraudulent duplication in voting. It will become apparent that such apparatus is complete in itself, but it is preferred that means be provided for definitely terminating the voting upon the removal of the casing 11 to tabulate the votes. The mechanism employed for definitely terminating the voting is preferably in the form of an automatic strip cutting mechanism by means of which the paper strips 31 are automatically severed between the feed roll and the ribbon, thus rendering the operation of any of the voting units inoperative until the strips which have been printed are removed from the apparatus, and the advancing end of the paper strips from the feed roll have been secured to the record spool 33.

The automatic paper cutting mechanism has been shown in detail in Figures 13 to 16 inclusive. As shown in Figure 6, the paper cutting mechanism is arranged between the paper feed roll and the ribbon and comprises a pair of supporting posts 140 arranged adjacent opposite ends of the apparatus and supporting a horizontal tubular member 141. This tube is provided with an upper slot 142 extending substantially throughout its length and a pair of lower aligned slots 143 and 144 having their inner ends spaced from each other as shown in Figure 14. A rod 145 is mounted to slide in the tube 141 and carries a pair of cutting units at its ends as shown in Figure 15, these units being respectively designated as a whole by the numerals 146 and 147. Each end of the bar 145 is transversely slotted to receive a block 148 carrying a cutting wheel 149 arranged against a cutting blade 150 having an inclined cutting edge 151. The inclination of the cutting edges of the two cutting members 150 is in the direction of movement of the cutting operation, as will become apparent.

The cutting unit 146 is provided with a depending shank 152, preferably formed integral with the associated cutting blade 150 and provided at its lower end with a ring 153 or similar finger piece by means of which the cutting mechanism may be reset, as will become apparent. The shank 152 is also provided with an eye 154 to which is connected one end of an elongated tension spring 155, the other end of this spring being connected to the supporting post 140 at the opposite end of the apparatus, as shown in Figures 13 and 14.

A latch member 156 is pivotally connected as at 156' to the post 140 adjacent the normal position of the cutting unit 146. This latch member is provided with a latch hook 157 engageable with a pin 158 projecting laterally from the shank 152. When the latch member 156 is in the operative position shown in Figure 13, the cutting mechanism is set for operation. An operating member 159 is pivotally connected to the latch member 156 as at 160 and is biased to the normal position shown in Figure 16. Obviously, the operating member 159 is free to swing downwardly from the position shown, but upon upward movement of the operating member 159, this member and the latch member 156 operate as a unit to release the latch hook 157 from the pin 158. A lug or finger 161 is secured to the casing 11 and is of sufficient length to prevent the removal of the casing without operating the member 159.

At least one lock post 162 is secured to the base 10 adjacent each end of the machine, and each post is slotted as at 163 to receive a lock bar 164 carried and operated by a lock 165. It will be apparent that the lock posts 162 are arranged in close proximity to the ends of the casing 11, and accordingly the casing cannot be moved longitudinally when being removed for the purpose of preventing the finger 161 from operating the member 159.

The operation of the apparatus is as follows:

As previously stated, the voting apparatus is arranged within the booth 15 to which access is had through the gate 17. Assuming that the apparatus has been operated to vote for various candidates, the several master switches 104 of the master switch units A, B, D, C, E and F will be held in latched position as indicated in Figure 9, all of the master switches under such conditions being disengaged from their contacts 107. Upon entering the booth, the prospective voter swings the gate 17 inwardly, thus moving the contact 29 into engagement with the contact 26. The engagement between these contacts takes place only momentarily, and after entering the booth, the voter releases the gate, whereupon it gravitates to closed position by virtue of the

engagement of the roller 20 (Figures 10 and 11) with the cam surface 21. The momentary making of the circuit across the contacts 26 and 29 is all that is necessary to prepare the entire apparatus for the voting operation.

The engagement of the switch contacts 26 and 29 closes the parallel circuits through the solenoid 51 and magnet 117 through wires 121 and 30, through switch contacts 29 and 26, wire 27, across the solenoid 51 and magnet 117, and back to the source through wires 122 and 120. The energization of the magnet 117 causes it to attract its armature 118 (Figure 9) thus rocking the bar 114 about the axis of the stub shafts 115. The bar 114 engages beneath the free ends of the latch bars 110, all of these bars normally occupying the solid line position shown in Figure 9. Thus all of the latch bars 110 will be simultaneously elevated upon swinging movement of the gate 17 in a clockwise direction as viewed in Figure 7, and the spring 108 of each master switch 104 will move it to its closed position as shown in Figure 8. As will become apparent this operation places each of the voting units in condition for operation.

Energization of the solenoid 51 causes its armature 54 (Figure 6) to be attracted, and accordingly the lower end of the lever 53 will swing in a clockwise direction as viewed in Figure 6. The pawl 59, engaging one of the teeth of the ratchet wheel 57, rotates the platen one step, thus advancing the paper strips 31 around the platen the proper distance between printed lines. Rotation of the platen is imparted to the record spool 33 through the endless drive member 61, and accordingly the record spool is positively advanced, upon each actuation of the ratchet wheel 57, to wind the paper strips on the record spool. The paper strips, of course, are unwound from the supply spool 31 as the operation referred to takes place.

Referring to Figures 3 and 4, it will be noted that the endless ribbon 45 is advanced in a step by step movement simultaneously with the corresponding movement of the platen. The friction wheel 62 is carried by the platen shaft 43 and engages the friction disk 63 of the ribbon roller 50. At each movement of the platen therefore, the friction wheel 62 advances the ribbon roller 50, thus causing the ribbon to be advanced in a step by step movement corresponding to that of the platen. Thus the printing operations are successively advanced to different portions of the ribbon as in the operation of a conventional typewriter.

As previously stated, the releasing of the master switches 104 prepares all of the voting units for operation. Moreover, the closing of the master switches illuminates all of the lights 77 throughout the length of the machine. In this connection, it will be noted that the strips 85 (Figure 6) are formed of translucent material and carry the name of a candidate above each light 77, together with the party affiliation of the candidate and the office for which he is running. These candidates are divided into groups according to the offices for which they are running. For example, in Group A, the name of a candidate for Governor of a State may appear above each of the lights 77. In Group B the name of a candidate for Lieut. Governor may appear above each of the lights, etc.

Accordingly it will be apparent that after entering the booth, the voter will have plainly displayed before him the names of all the candidates for all of the offices to be voted upon, thus greatly facilitating the selection of the various candidates to be voted for. The circuit for the light 77 of one of the voting units will be clearly apparent from Figure 8. Current flows from one side of the source through wire 123 through one of the branch wires 124 to the associated contact 107. This contact engages the contact 106 under the conditions stated, and accordingly the light circuit will be completed through the switch arm 104, wires 131 and 132, light 77, wires 129 and 126, and thus back to the source. As will be explained, all of the lights of each voting group will have their circuits broken upon the casting of a vote for one candidate in the group.

Prior to the voting operation, all of the parts of each voting unit will occupy the position shown in Figure 8. Assuming that a voter has selected the candidate represented by the unit in Figure 8, it merely is necessary for him to press the push button 80 to cast his vote. Such operation completes a circuit through the solenoid 69, this circuit being the same as for the light 77 up to and including the wire 131, which is directly connected to one terminal of the push button. Upon operating the push button, the circuit is completed to the wire 131 in the manner described, thence to the wire 130 through the solenoid 69, and thence back to the source through wires 127, 126 and 120.

Energization of the solenoid 69 attracts the armature 71, causing it to move to the right as viewed in Figure 8. The type bar 72 strikes the ribbon 45, thus impressing on one of the paper strips the name of the candidate for whom the vote is being cast. The jack switch 101 is carried by the armature 71 and accordingly moves therewith. The jack switch 98 is carried by the bar 93, which is slidably supported by the bracket 91. Since the pin 96 (Figure 8) occupies the position shown in Figure 8 before the push button is operated, it will be apparent that this pin must move a substantial distance before engaging the finger 94 to cause the jack switch 98 to connect the clips 99. This operation takes place substantially simultaneously with the engagement of the jack switch 101 with the clips 100.

The engagement of the two jack switches with their respective clips performs two operations, namely, rendering all of the solenoids 69 of the units of the group inoperative against further voting, and energizing the solenoid 70 to effect the return of the parts of the unit to normal position. Upon engagement of the jack switch 101 with the clips 100, a circuit will be completed through wires 123, 124 and 125, through magnet coil 103, and wire 136, across the clips 100, and back to the source through wires 135, 126 and 120. Thus a circuit will be completed through the master magnet 103, whereupon this magnet attracts its armature 104. This armature will move toward the magnet until it clears the latch shoulder 111 (Figure 9) whereupon this latch drops to operative position to prevent the armature 104 from moving to operative position, namely, the position shown in Figure 8. As will be clear from Figure 7, each branch wire 124 forms the main wire for one side of the circuits for all of the units for one voting group, and after the casting of a vote in a manner to be described, the circuit through the wire 124 for the group of which the operated unit is a part, will be broken. The energization of the solenoid 69 of any unit of the group, upon operation of the push button, is dependent upon the completion

of the circuit across the corresponding contacts 106 and 107, and accordingly no further voting can take place in the group referred to. Thus each armature 104 forms the master switch for one of the voting groups.

As previously stated, the jack switch 98 will be actuated by the finger 96 substantially simultaneously with the closing of the circuit across the clips 100. When the clips 99 are electrically connected by the jack switch 98, a circuit will be completed through wire 134, clips 99, wire 133, the coil of solenoid 70, and thence back to the source through wires 128, 126 and 129. At the completion of the printing operation, therefore, the energization of the solenoid 70 attracts the common armature of the two solenoids, thus returning the armature and connected parts to their normal positions. As the normal position of the armature 71 is approached, the finger 96 will engage the finger 95, thus moving the jack switch 98 out of engagement with the clips 99. Thus the solenoid 70 will be deenergized, and all of the units of the group will remain inoperative until another voter enters the booth. The lost motion connection between the armature 71 and jack switch 98 is provided to permit the latter to remain in engagement with the clips 99 and thus retain the circuit for the solenoid 70 closed until the armature 71 and associated parts have nearly reached their inoperative position. The momentum of the parts will be ample to complete the movement to inoperative position upon the breaking of the circuit across the clips 99.

Having voted for a candidate for one office, the corresponding master switch 104 will render inoperative the group including the voting unit which has been operated. The remaining master switches 104 will remain in operative position, and accordingly the voter may proceed from group to group operating only a single voting unit of each group. After casting his vote for each candidate for office, the voter then leaves the booth, under which conditions the gate 17 will be turned in a counter-clockwise direction as viewed in Figure 7, the brush 29 under such conditions, being moved away from the contact 26 without effecting an operation of any of the electrical elements of the apparatus. If the voter has cast a vote for each candidate, all of the master switches 104 will occupy the position shown in Figure 9 when the voter leaves the booth.

The next voter, upon entering the booth, will move the gate 17 inwardly, whereupon the operations previously described will be repeated, all of the master switches being released and all of the voting units being prepared for operation, and the platen and ribbon being advanced another step by the mechanism described.

After the voting has been completed, and the tabulation of votes is to take place, an authorized officer will unlock the casing 11 and remove it from the base 10. The removal of the base can take place only substantially vertically due to the location of the various parts, and upon the elevation of the casing 11, the finger 161 (Figure 13) will engage the operating member 159, thus causing the latch 156 to release the pin 158. The spring 155 then moves the cutting unit toward the right from the position shown in Figure 13, and each of the cutting elements will sever its associated strip, the cutting unit then assuming the position shown in solid lines in Figure 14.

This operation severs the paper strips between the supply roll 32 and the ribbon 45 whereupon the record roll may be removed to provide a permanent record of the vote. The number of votes need not be counted on the record roll since the counters 86 will have counted each of the votes cast for each candidate. It will be apparent that each counter is connected by its associated arm 88 to one of the armatures 71, and the complete operation of any armature 71 causes an operation of the associated counter 86. Thus these counters record the total number of votes for each candidate, and the number of votes may be readily ascertained after the cover or casing 11 is removed.

The voting machine can be placed in operation for further voting only by restoring the normal condition of the paper strip. In other words, the advancing edges of the severed strips must be again connected to the record spool by clamping them beneath the removable section 34. Prior to this operation, however, the operator should engage the finger piece 153 (Figure 13) and restore the cutting unit to its normal position. The cutting unit is moved to the left as viewed in Figure 13 against the tension of the spring 155 until the latch 156 engages the button 158. The casing 11 then may be replaced by moving it substantially vertically downwardly, the finger 161 escaping over the operating member 159 since this member is free to turn downwardly. The casing is then locked, whereupon it is ready for further operation.

From the foregoing it will be apparent that the present apparatus provides numerous highly advantageous features. The name of each voter is illuminated, and upon the casting of a vote for any candidate, the circuits through the lights beneath the names of all candidates for the same office are broken. All of the units of a group are rendered completely inoperative upon the casting of one vote in such group, thus rendering the fraudulent duplication of votes impossible. The votes are automatically counted; the record strips are automatically advanced with the names of the candidates printed thereon; the ribbon 45 is automatically advanced by the entrance of each voter into the booth, and the record strip is automatically severed upon the removal of the casing 11 to ascertain the results of the voting. It will be apparent that the apparatus is of such nature as to greatly facilitate the operation of voting for different candidates, a minimum amount of time being required for each voter.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A voting apparatus comprising a plurality of voting units each including an electro-magnetic device, manually operable means for closing the circuit through the electro-magnetic device of each unit, a master switch for the circuits of said electro-magnetic devices, an electro-magnet for opening said master switch upon the operation of any one of said manually operable means, and a latch automatically engageable with said master switch when the latter reaches open position for holding it in such position.

2. A voting apparatus comprising a plurality of voting groups each comprising a plurality of voting units, each of said units comprising an

electro-magnetic device operative for casting a vote, and a manual switch for said electro-magnetic device, a master control switch for all of the electro-magnetic devices of each group, an electro-magnet energizable for opening each master control switch, means operative upon the energization of any one of said electro-magnetic devices for energizing said electro-magnet, a latch engageable with each master control switch when the latter reaches open position, and common means for simultaneously releasing all of said latches.

3. A voting apparatus comprising a plurality of voting groups each comprising a plurality of voting units, each unit comprising an electro-magnetic voting device and a manual control switch therefor, a master control switch for all of the electro-magnetic devices of each group, means for opening each of said master control switches upon energization of any one of said electro-magnetic devices in the corresponding group, means for latching each master control switch in its open position, and common means for simultaneously releasing all of said latches.

4. A voting apparatus comprising a plurality of voting groups each comprising a plurality of voting units, each unit comprising an electro-magnetic voting device and a manual control switch therefor, a master control switch for all of the electro-magnetic devices of each group, means for opening each of said master control switches upon energization of any one of said electro-magnetic devices in the corresponding group, means for latching each master control switch in its open position, a rocking member having an eccentric portion simultaneously engageable with all of said latches, and electro-magnetic means for operating said rocking member to simultaneously release all of said latches.

5. A voting apparatus comprising a booth having an entrance passageway, an entrance gate normally blocking said passageway whereby a voter must move said gate when entering and leaving said booth, a voting machine in said booth remote from said gate comprising a plurality of voting units, each voting unit comprising an electro-magnetic voting device, a manual switch for each electro-magnetic device, a master control switch for opening the circuits of all of said electro-magnetic devices, an electro-magnet for opening said master control switch, means operative upon operation of any one of said manual switches for energizing said electro-magnet, and means operative upon movement of said gate for restoring said master control switch to closed position.

6. A voting apparatus comprising a booth having an entrance passageway, an entrance gate normally blocking said passageway whereby a voter must move said gate when entering and leaving said booth, a voting machine in said booth remote from said gate comprising a plurality of voting units, each voting unit comprising an electro-magnetic voting device, a manual switch for each electro-magnetic device, a master control switch for opening the circuits of all of said electro-magnetic devices, an electro-magnet for opening said master control switch, means operative upon operation of any one of said manual switches for energizing said electro-magnet, a latch engageable with said master switch for holding it in open position, and means operative upon movement of said gate for releasing said latch.

7. A voting apparatus comprising a plurality of voting groups each comprising a plurality of voting units, each of said units comprising an electro-magnetic device operative for casting a vote, and an individual manual switch for said electro-magnetic device, a master control switch for all of the electro-magnetic devices of each group, means biasing each master control switch to closed position, an electro-magnet energizable for opening each master control switch, means operative upon the energization of any one of said electro-magnetic devices for energizing said electro-magnet, means for deenergizing each electro-magnet after it has opened its associated master control switch, a latch engageable with each master control switch when the latter reaches open position, and a single rocking eccentric means engageable with all of said latches for releasing them.

8. A voting apparatus comprising a plurality of voting groups each comprising a plurality of voting units, each of said units comprising an electro-magnetic device operative for casting a vote, and an individual manual switch for said electro-magnetic device, a master control switch for all of the electro-magnetic devices of each group, means biasing each master control switch to closed position, an electro-magnet energizable for opening each master control switch, means operative upon the energization of any one of said electro-magnetic devices for energizing said electro-magnet, means for deenergizing each electro-magnet after it has opened its associated master control switch, a latch engageable with each master control switch when the latter reaches open position, said latches being arranged substantially in parallel relation, and a single mechanical device extending across the planes of and engageable with said latches and operative for simultaneously releasing them.

9. A voting apparatus comprising a plurality of voting units each including a pair of axially aligned solenoids having a common armature, individual manually operable means for closing a circuit through a first solenoid of each pair to effect a voting operation, a master control switch for the circuits of the first solenoids of all of the pairs, an electro-magnet for opening said master switch, means for energizing said electro-magnet upon movement of either armature upon energization of the first solenoid of the associated pair, and means operative upon movement of either armature upon energization of the first solenoid of either pair to complete a circuit through the other solenoid of such pair to return the armature to normal position.

10. A voting apparatus comprising a plurality of voting units each including a pair of axially aligned solenoids having a common armature, individual manually operable means for closing a circuit through a first solenoid of each pair to effect a voting operation, a master control switch for the circuits of the first solenoids of all of the pairs, an electro-magnet for opening said master switch, means for energizing said electro-magnet upon movement of either armature upon energization of the first solenoid of the associated pair, means operative upon movement of either armature upon energization of the first solenoid of either pair to complete a circuit through the other solenoid of such pair to return the armature to normal position, means for latching said master control switch in open position when moved to such position by said electro-magnet, and remotely operable means for releasing said latching means.

11. A voting apparatus comprising a booth having an entrance passageway, an entrance gate normally blocking such passageway whereby a voter must move said gate when entering or leaving said booth, a voting machine in said booth remote from said gate comprising a plurality of voting units each comprising an electro-magnetic voting device, and a manual switch for such electro-magnetic device, a master control switch for the circuits of all of said electro-magnetic devices, means for opening said master control switch upon operation of any one of said manual switches to simultaneously open the circuits of all of said electro-magnetic devices, and means operative upon movement of said gate for restoring said master control switch to closed position.

12. A voting apparatus comprising a plurality of voting groups each comprising a plurality of voting units, each of said units comprising an electro-magnetic device operative for casting a vote, and an individual manual switch for such electro-magnetic device, a master control switch for the electro-magnetic devices of each group, said master control switch being biased to closed position, means operative upon the operation of any one of said manual switches for opening the corresponding master control switch to simultaneously open the circuits through all of the electro-magnetic devices of the corresponding group, means for holding each master control switch open after it has opened the circuits through the electro-magnetic devices of its corresponding group, a single mechanism operable for simultaneously releasing all of said master control switches for movement to closed position, and an electro-magnetic device for operating said single mechanism.

13. A voting apparatus comprising a plurality of voting groups each comprising a plurality of voting units, each of said units comprising an electro-magnetic device operative for casting a vote, and an individual manual switch for said electro-magnetic device, a master control switch for all of the electro-magnetic devices of each group, means biasing each master control switch to closed position, an electro-magnet energizable for opening each master control switch, means for holding each master control switch open after it has been moved to open position, means operative upon the energization of any one of said electro-magnetic devices for energizing said electro-magnet, means for deenergizing each electro-magnet after it has opened its associated master control switch, and a single mechanism operable for simultaneously releasing all of said master control switches for movement to closed position.

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