No. 666,987. Patented Jan. 29, 1901.

G. W. TROMMLITZ & W. H. POWERS.

VOTING MACHINE.

(Application filed Mar. 9, 1900.)

(No Model.) 7 Sheets—Sheet 1.

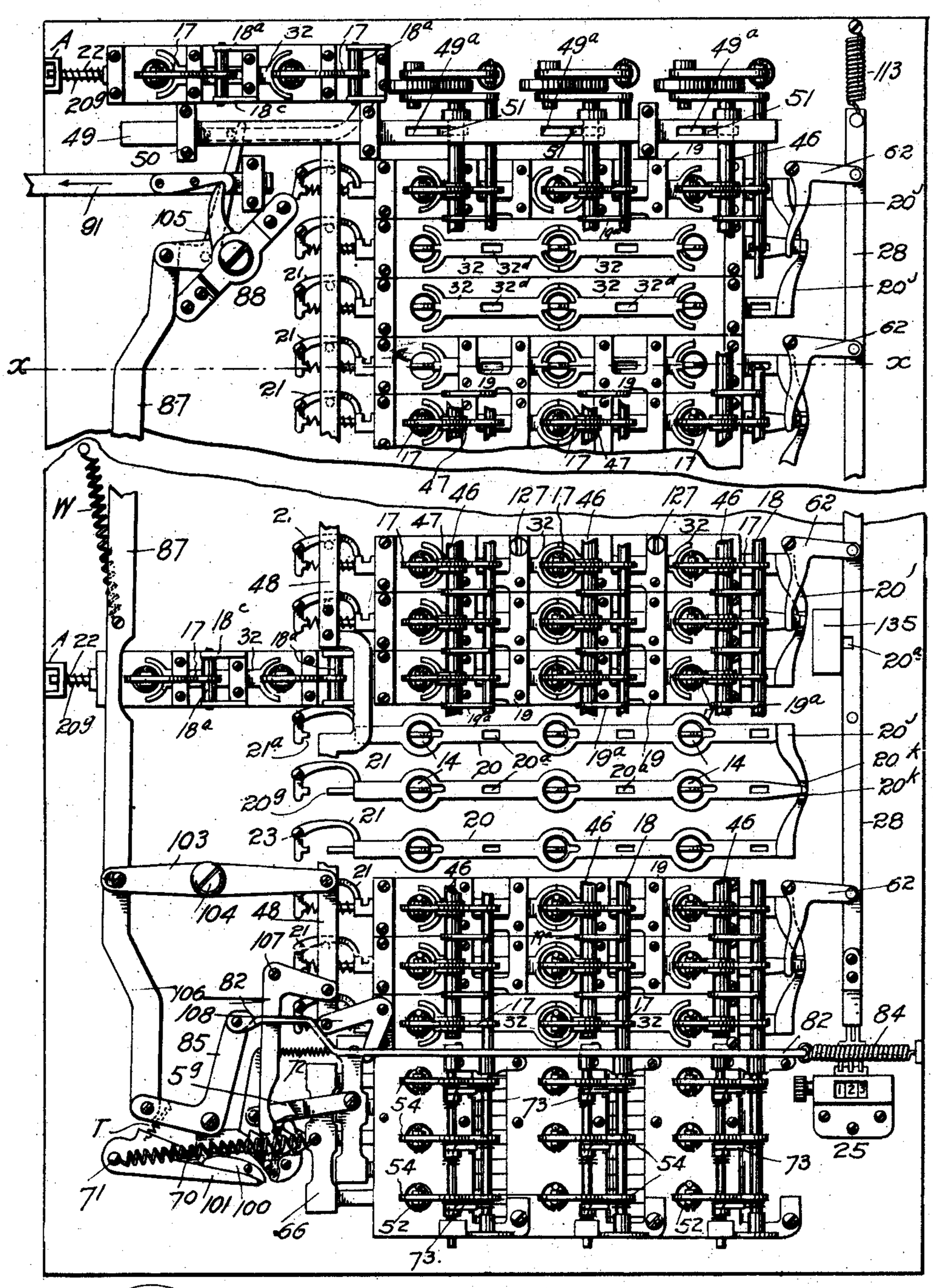

Fig. 1.

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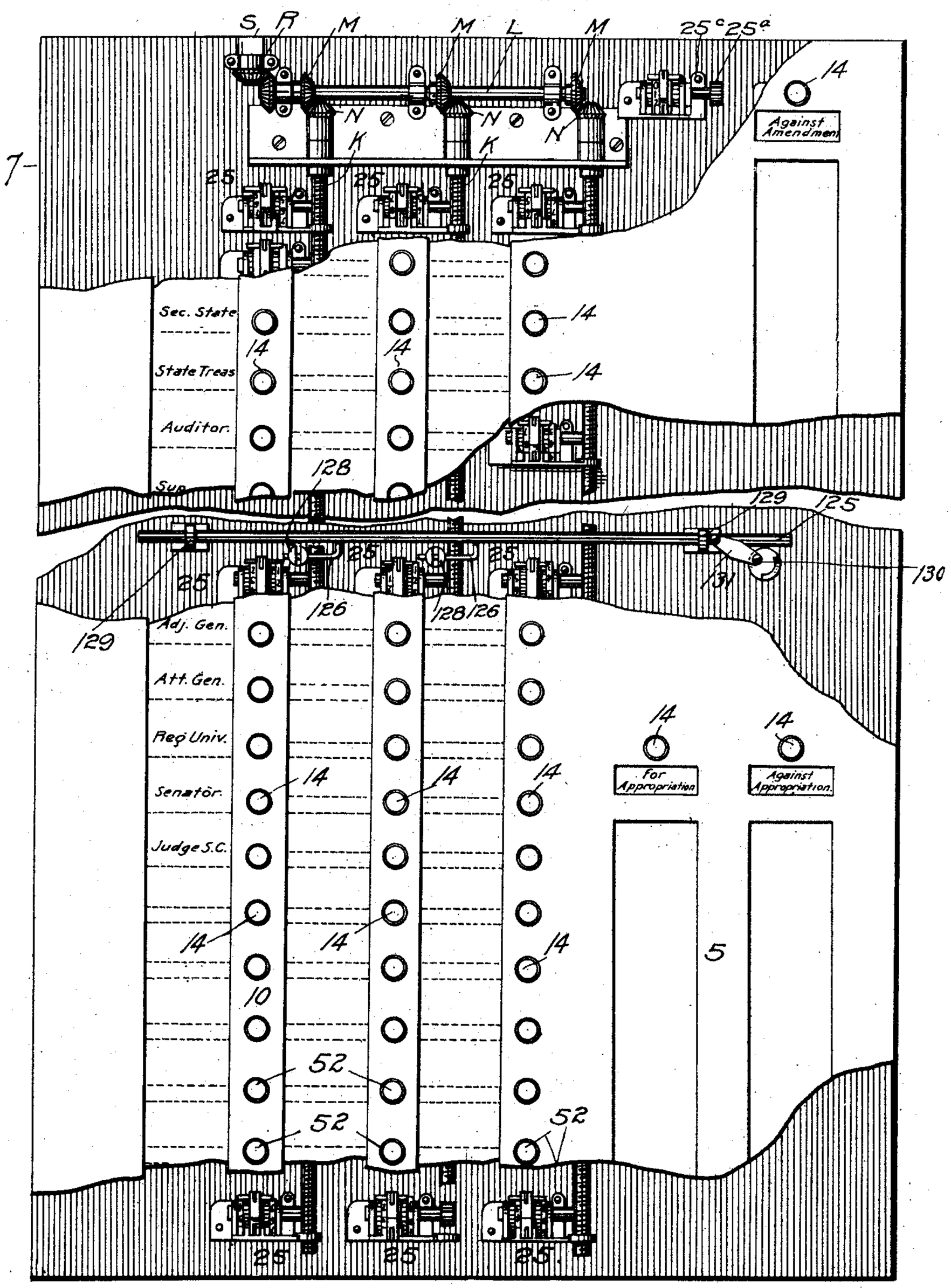

Fig. 2.

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(No Model.) 7 Sheets—Sheet 3.

Fig. 3.

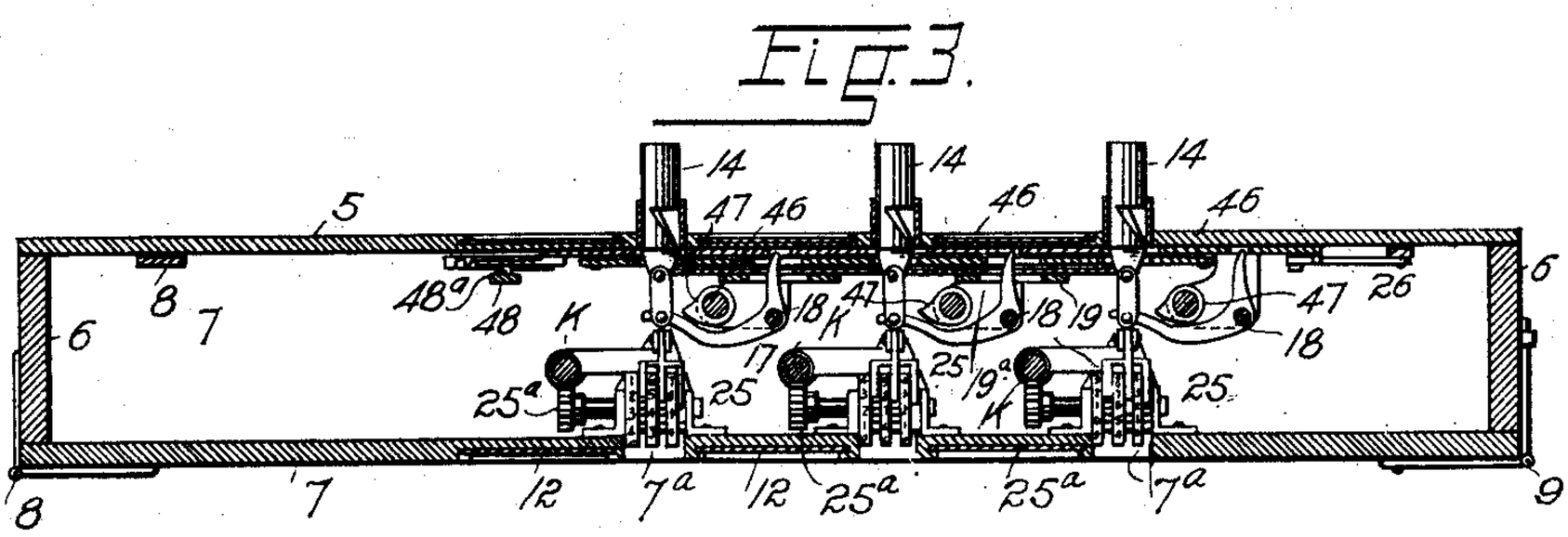


Fig. 4.

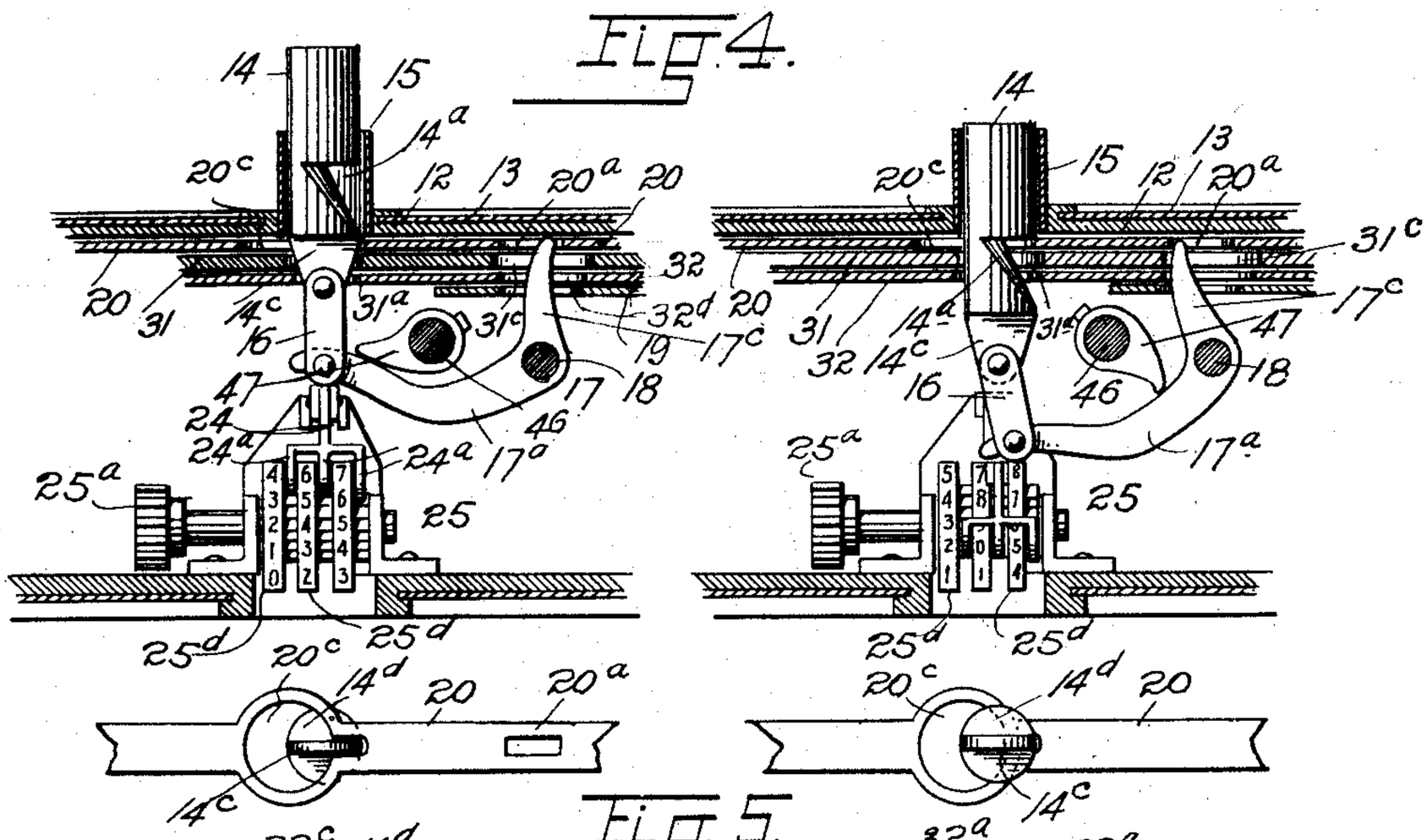


Fig. 5.

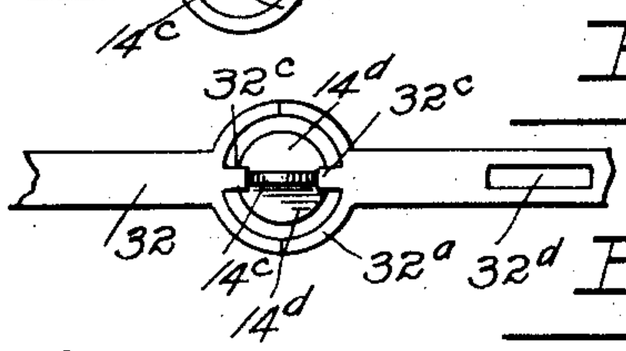


Fig. 6.

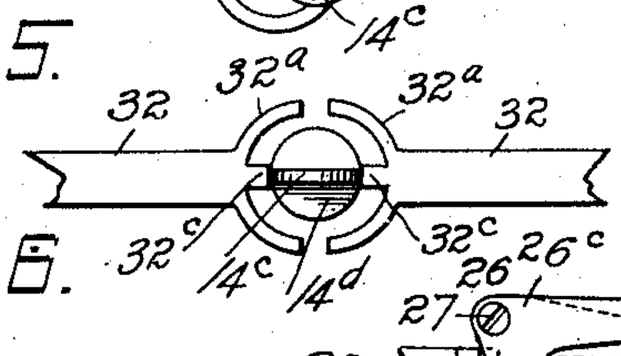
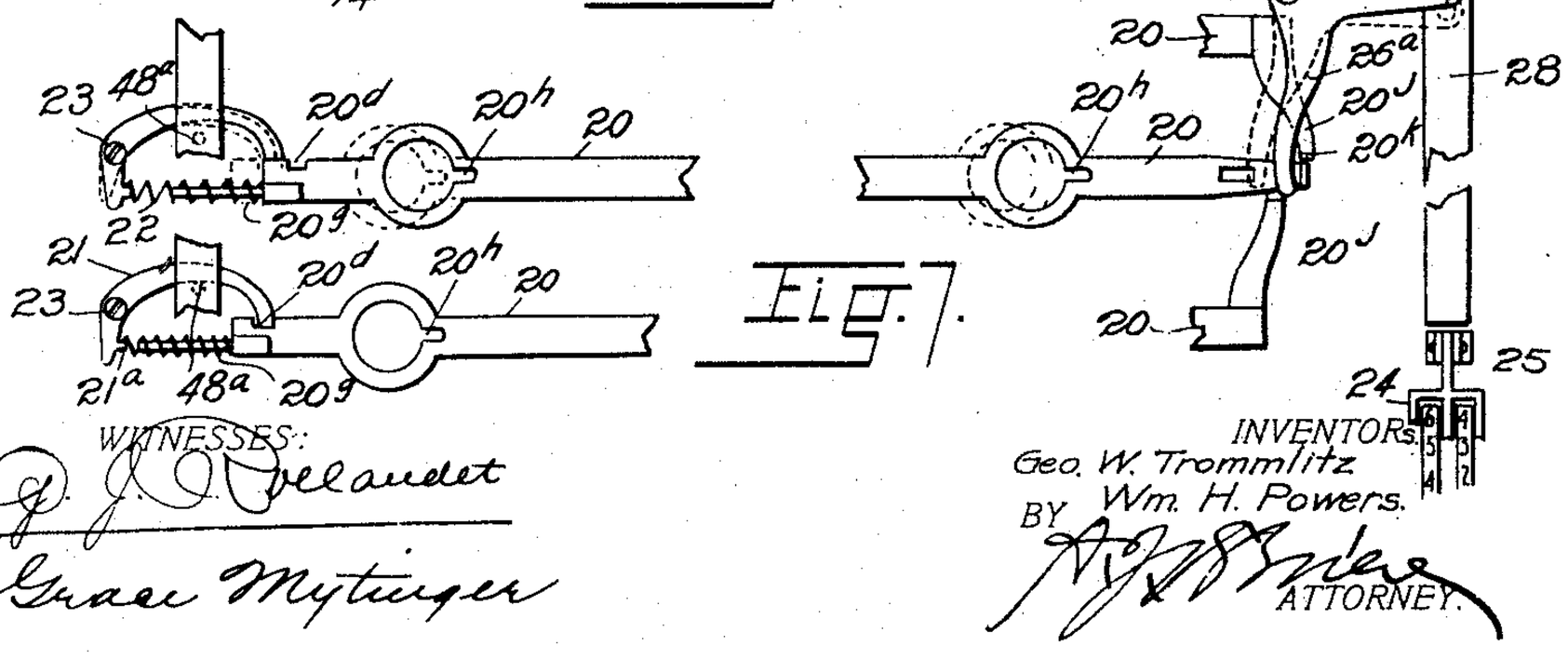


Fig. 7.



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VOTING MACHINE.

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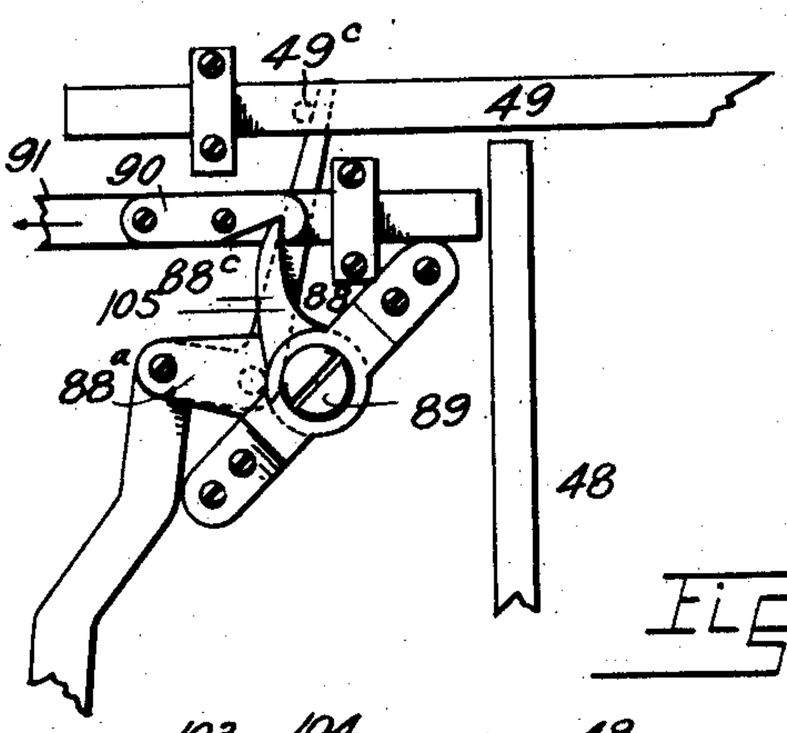


Fig. 8.

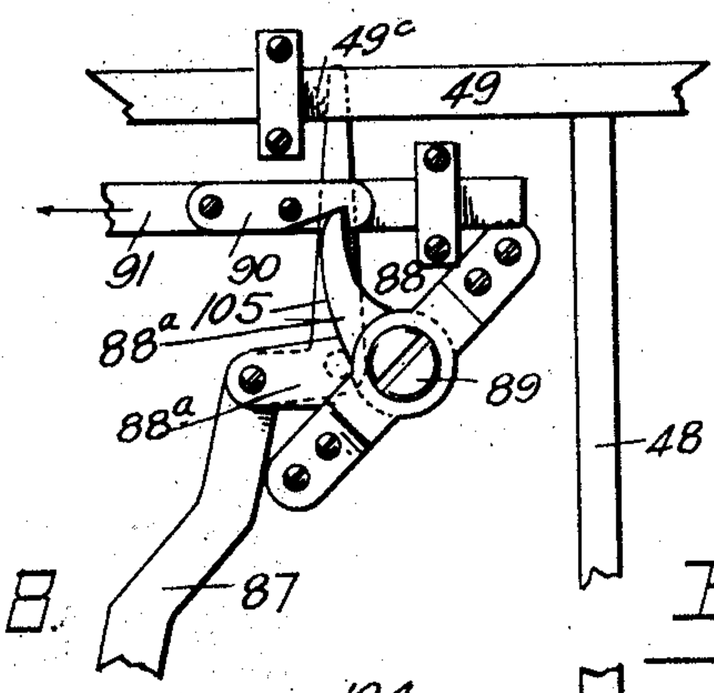
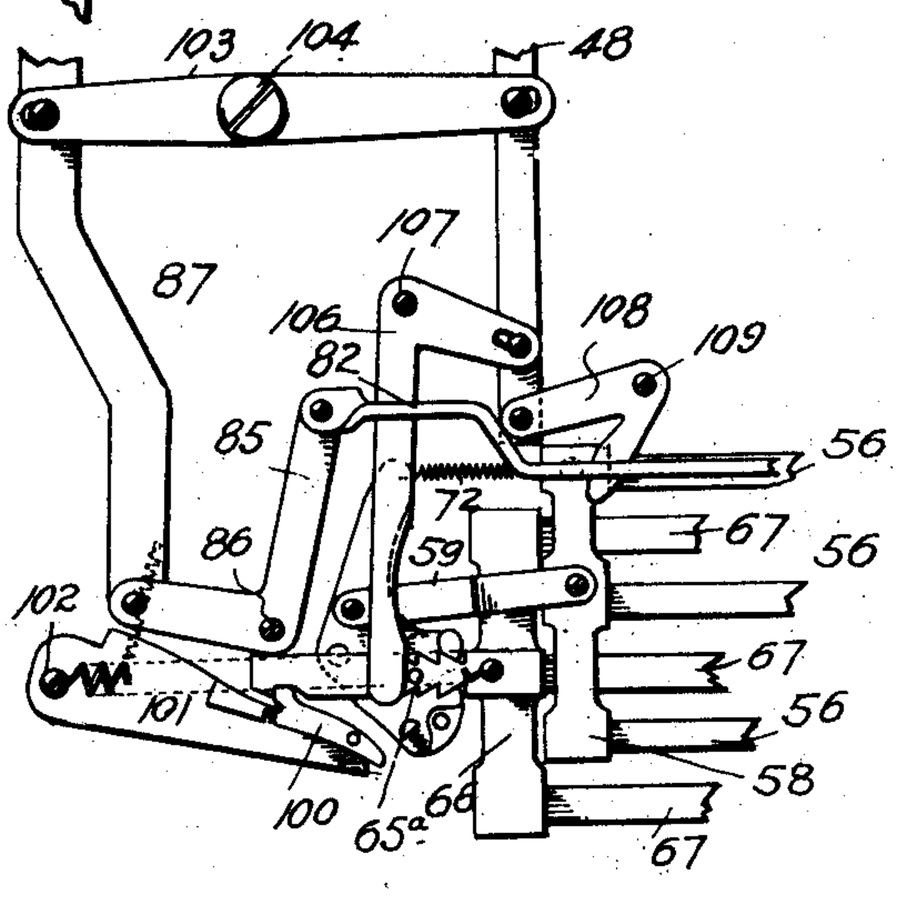
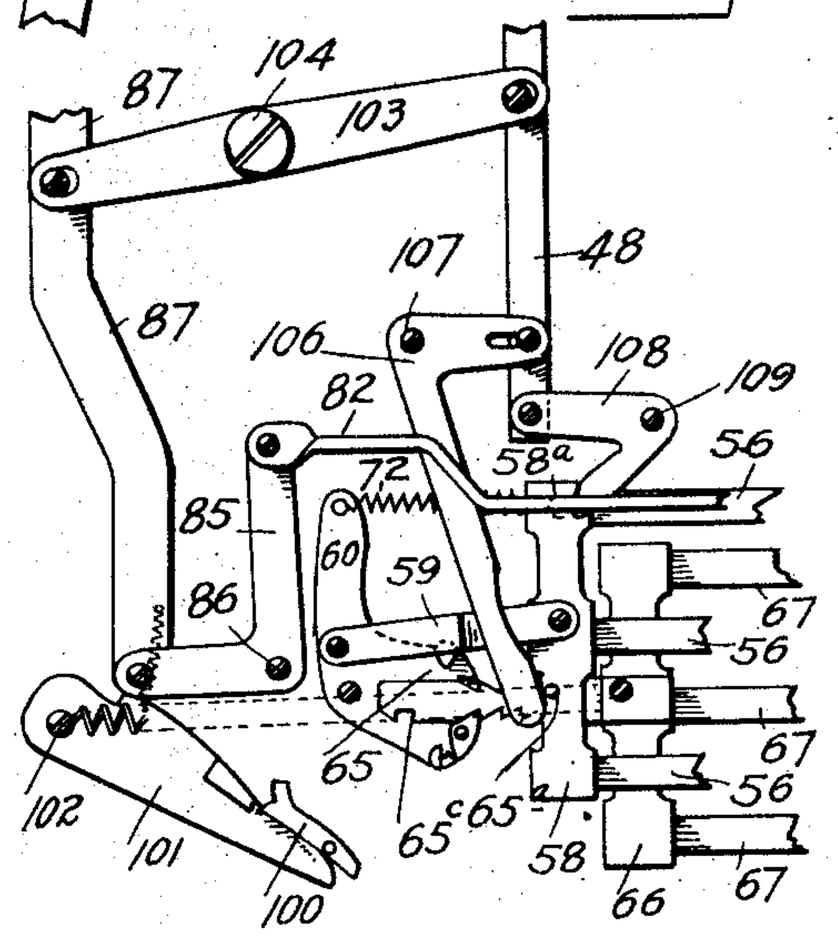


Fig. 9.





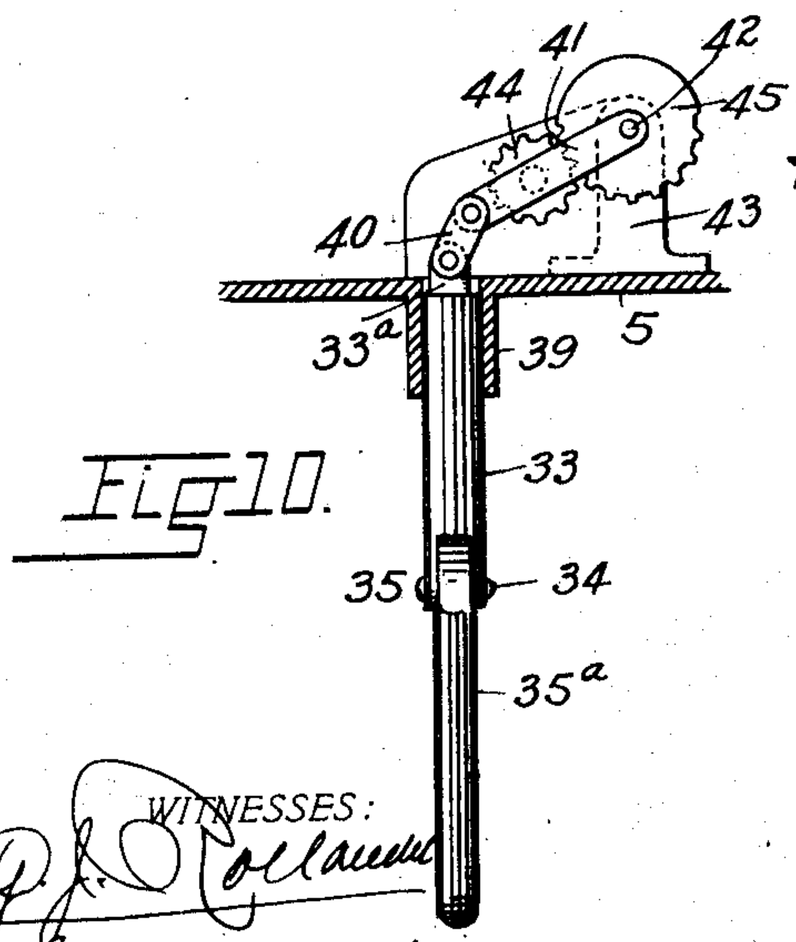


Fig. 10.

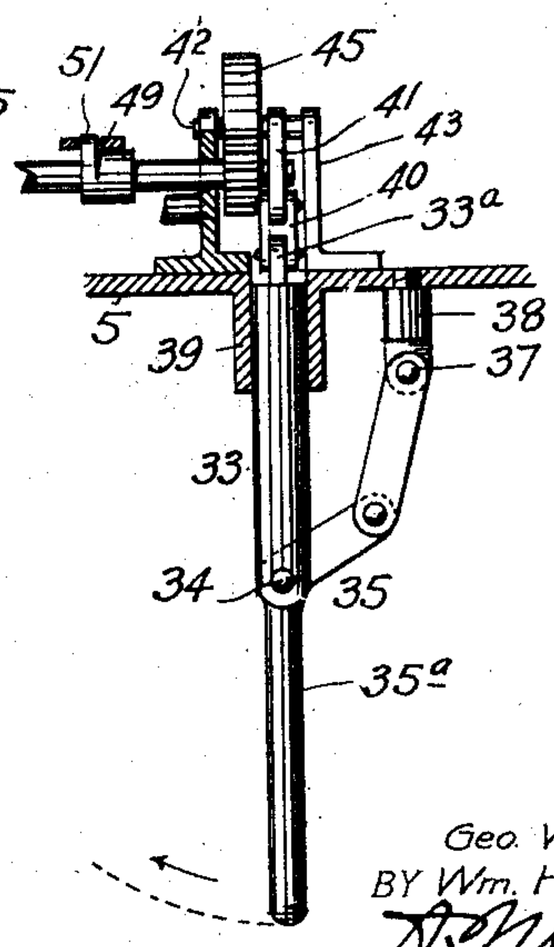


Fig. 11.

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No. 666,987. Patented Jan. 29, 1901.

G. W. TROMMLITZ & W. H. POWERS.

VOTING MACHINE.

(No Model.) (Application filed Mar. 9, 1900.)

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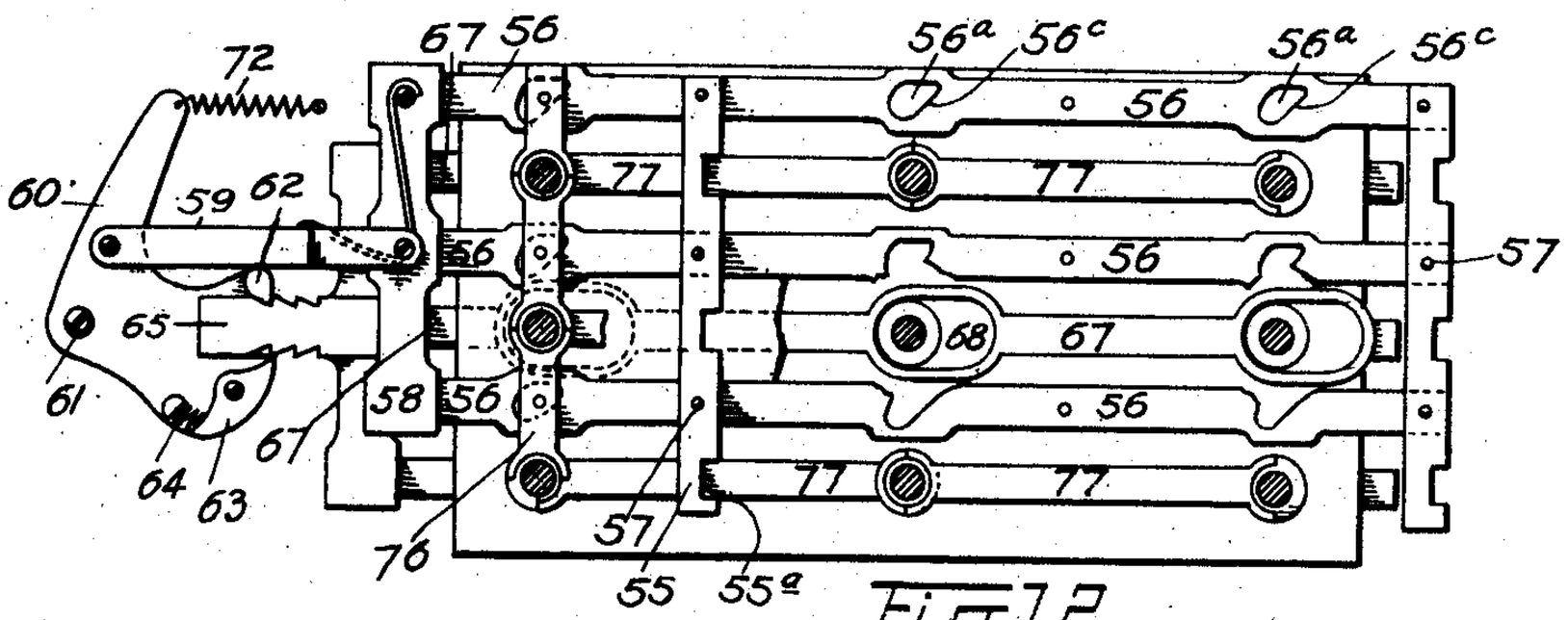

Fig 12.

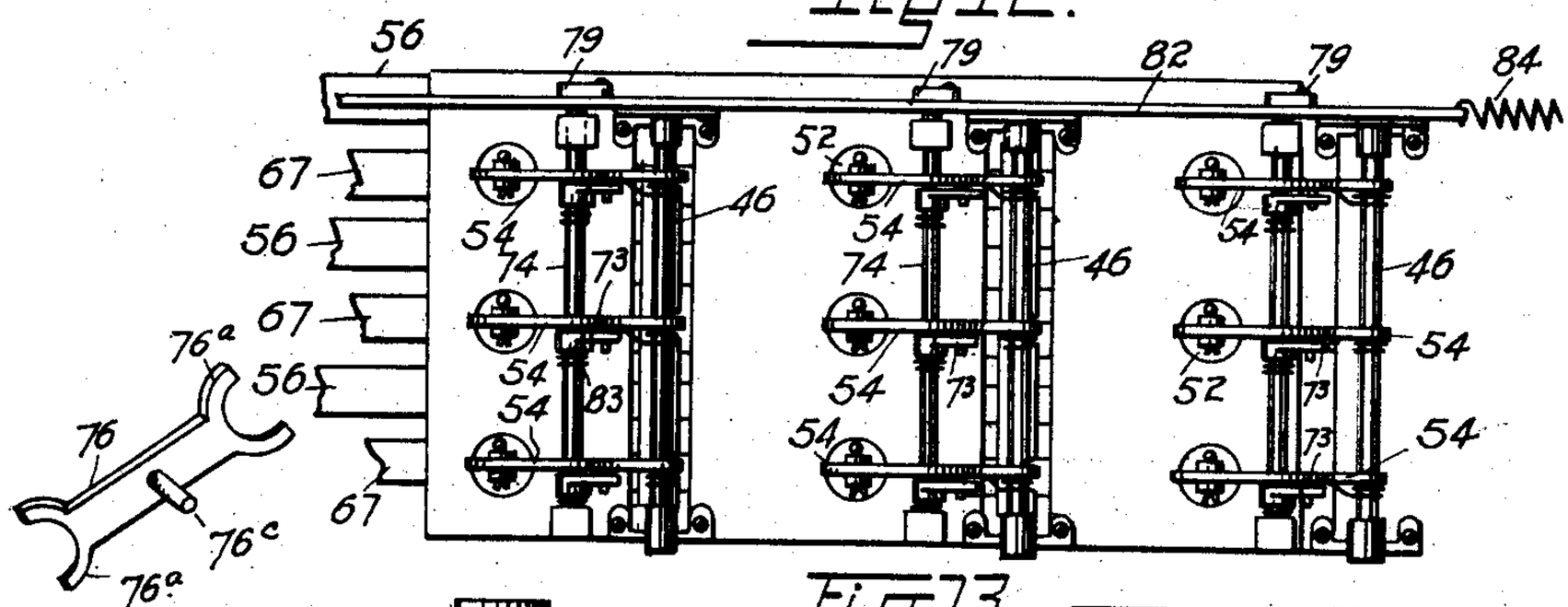

Fig 13.

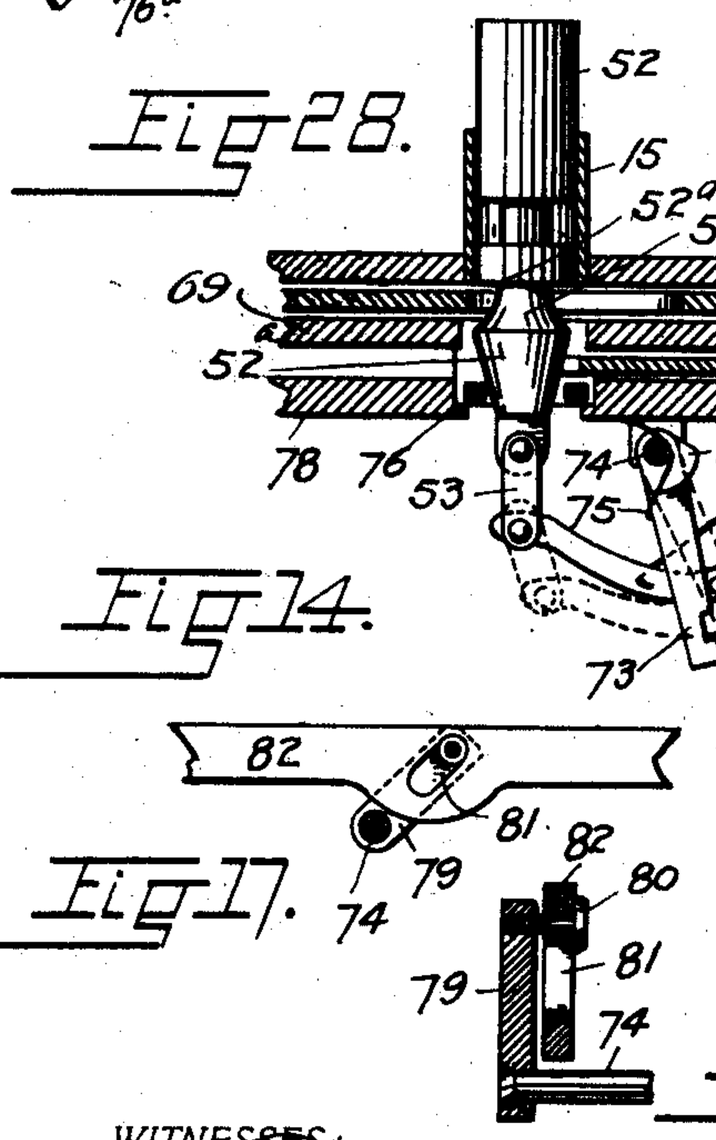

Fig 14.

Fig 17.

Fig 18.

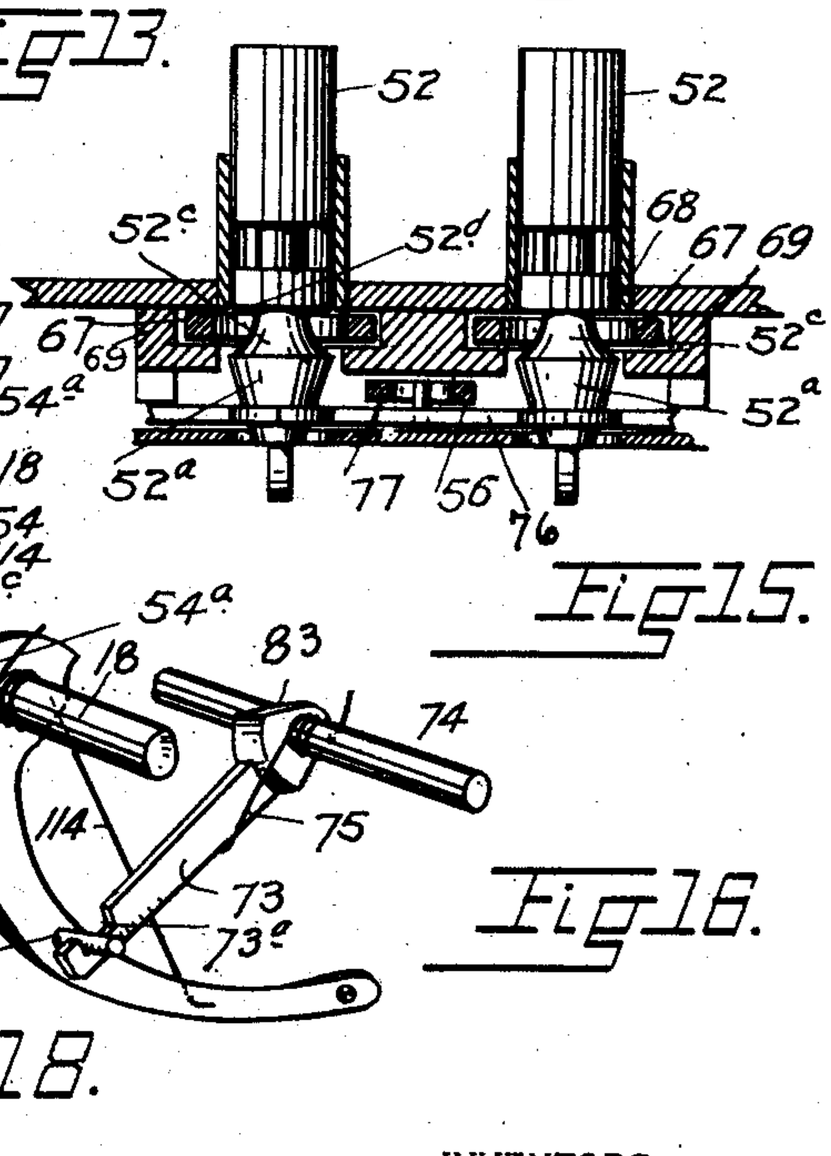

Fig 15.

Fig 16.

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G. W. TROMMLITZ & W. H. POWERS.

VOTING MACHINE.

(No Model.) (Application filed Mar. 9, 1900.)

7 Sheets—Sheet 6.

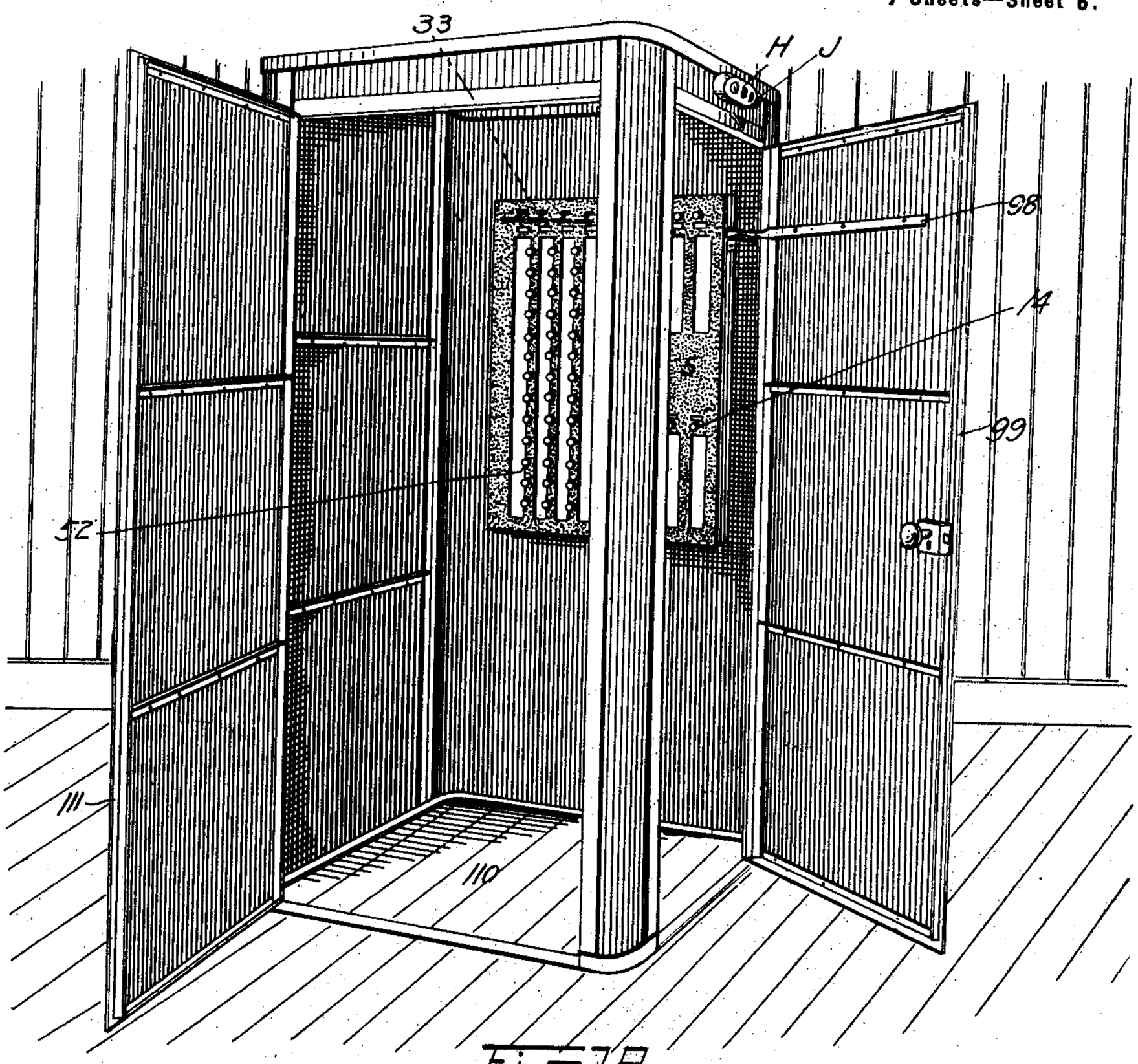

Fig 19.

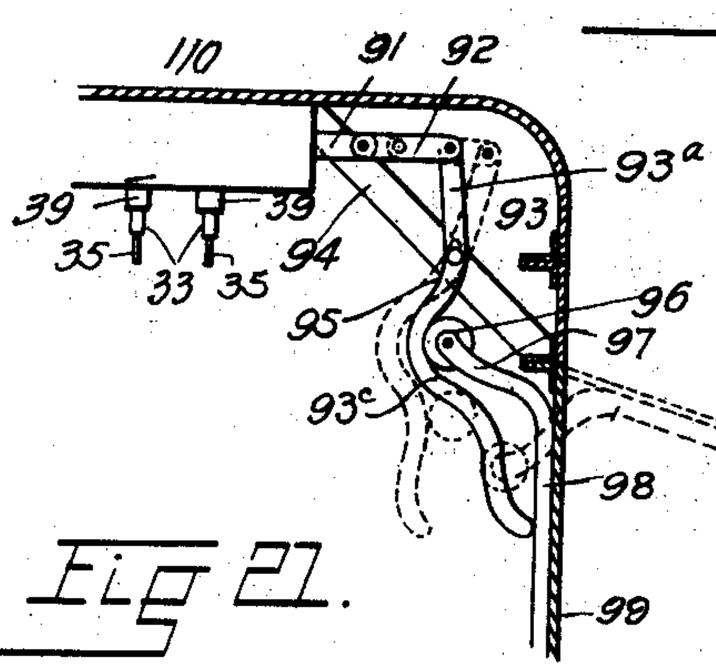

Fig 21.

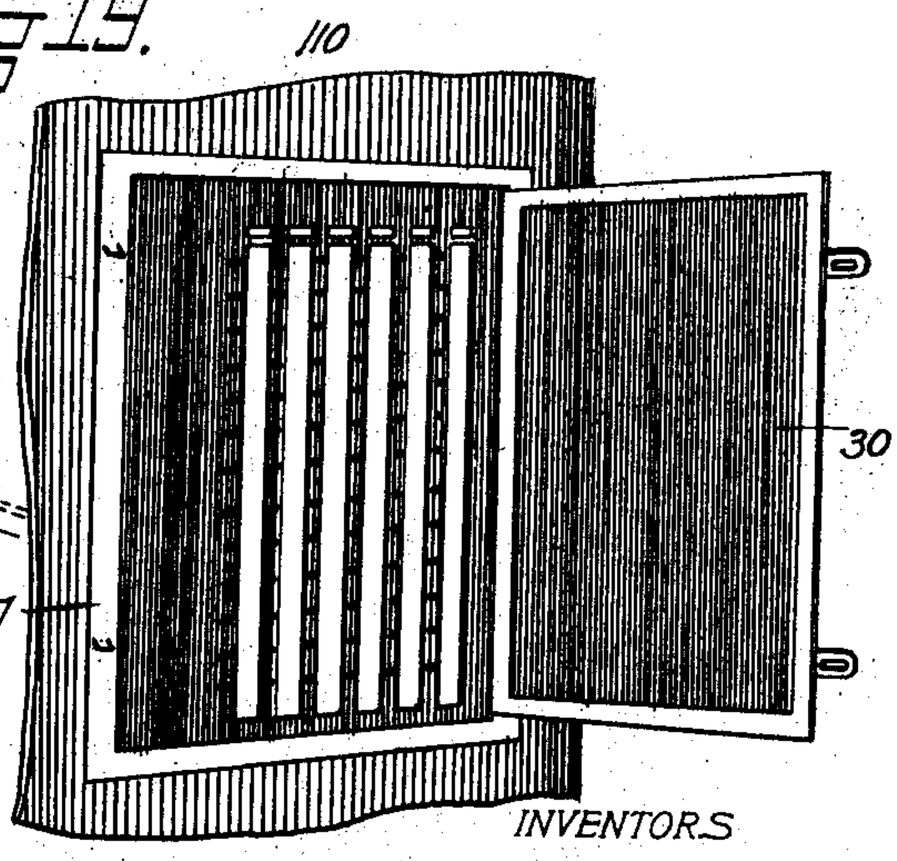

Fig. 20.

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No. 666,987. Patented Jan. 29, 1901.

G. W. TROMMLITZ & W. H. POWERS.

VOTING MACHINE.

(Application filed Mar. 9, 1900.)

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Fig. 24.

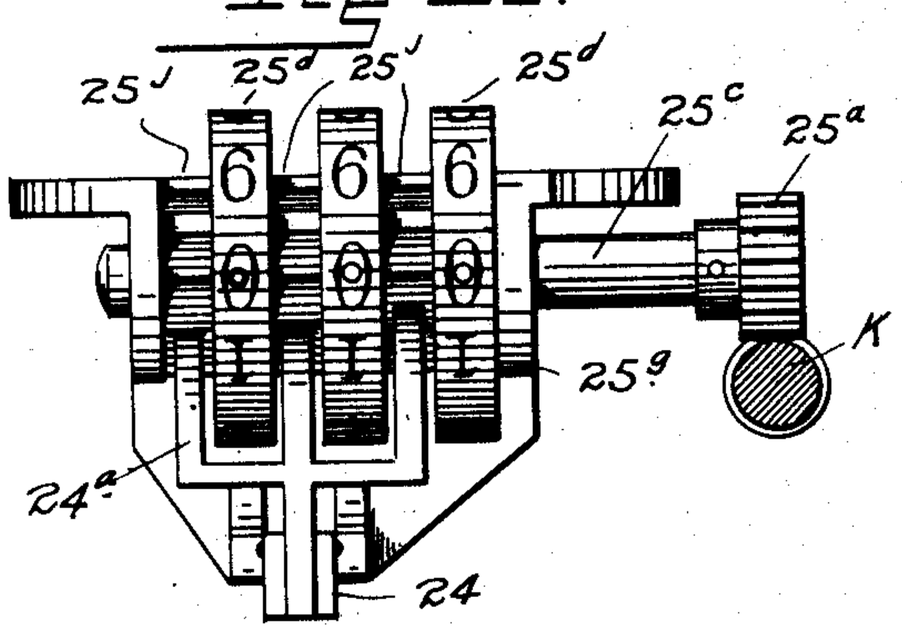
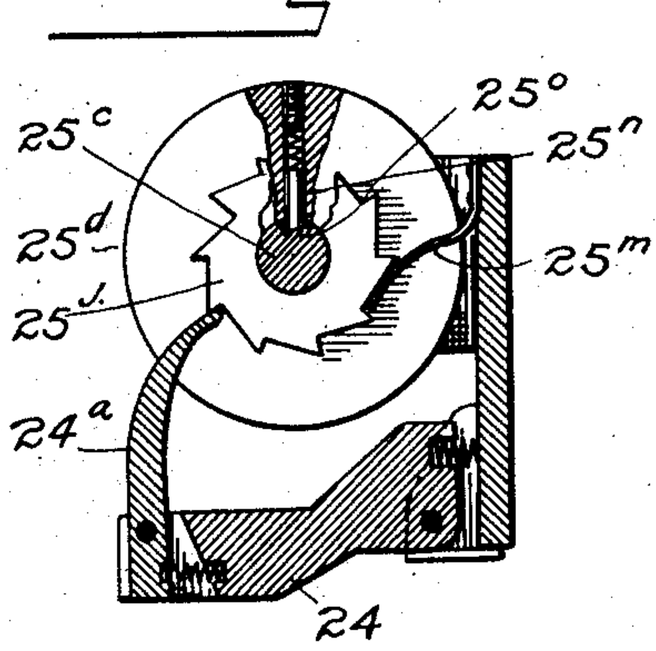


Fig. 26.



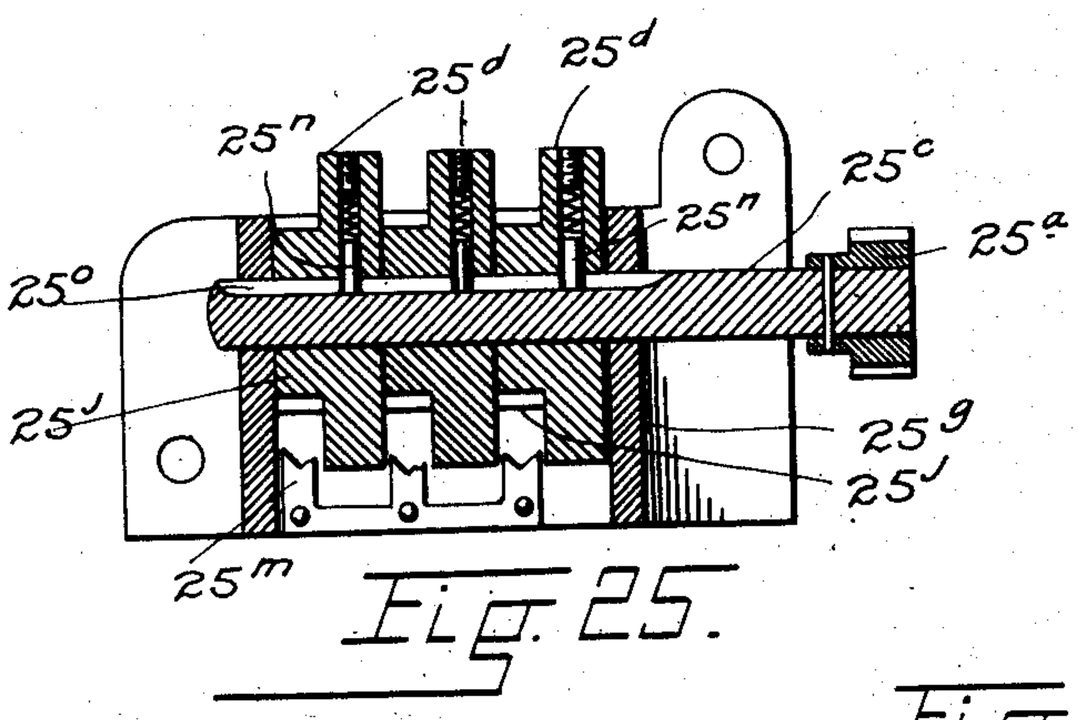


Fig. 25.

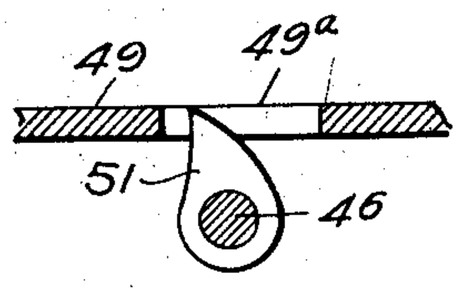
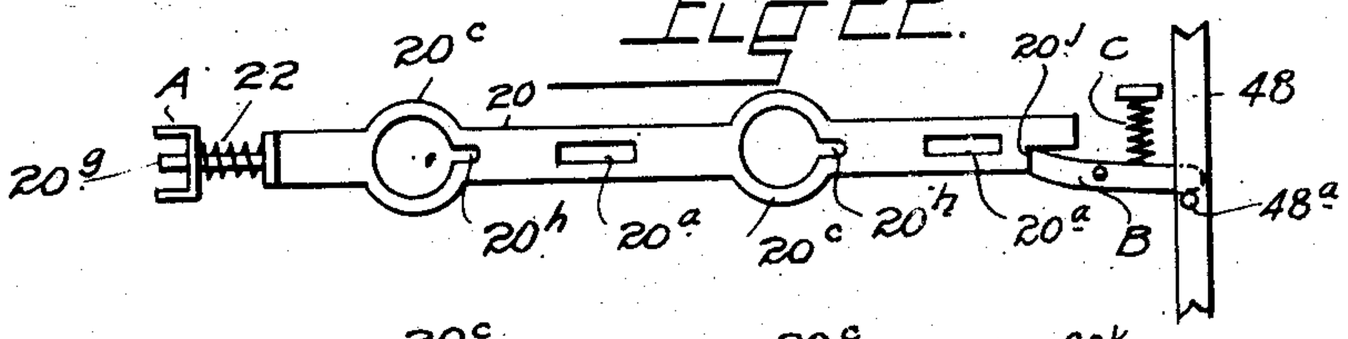


Fig. 27.

Fig. 22.



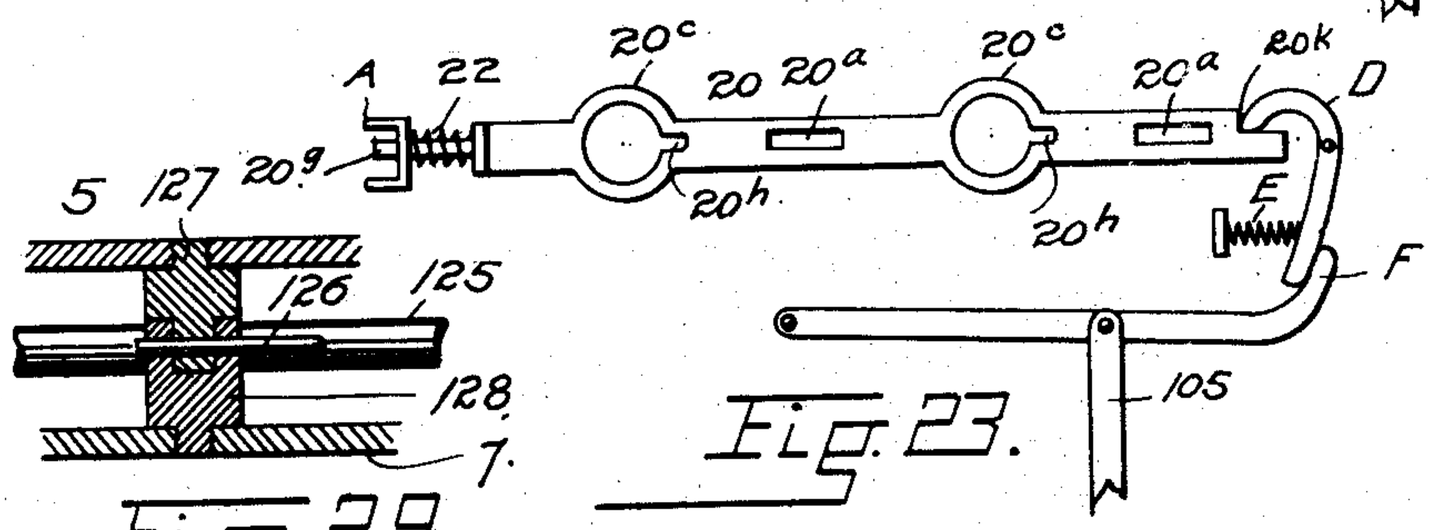


Fig. 23.

Fig. 29.

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UNITED STATES PATENT OFFICE.

GEORGE WILLIAM TROMMLITZ AND WILLIAM HENRY POWERS, OF DENVER, COLORADO, ASSIGNORS TO THE TROMMLITZ VOTE REGISTER COMPANY, OF SAME PLACE.

VOTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 666,987, dated January 29, 1901.

Application filed March 9, 1900. Serial No. 8,065. (No model.)

To all whom it may concern:

Be it known that we, GEORGE WILLIAM TROMMLITZ and WILLIAM HENRY POWERS, citizens of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Voting-Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in voting-machines, the object being to provide a machine or apparatus capable of effectually performing all of the functions necessary or required in a machine of this character. In this machine provision is made for voting straight or mixed tickets at the will of the voter; for the locking of all the other keys corresponding with the candidates for the same office on the different tickets as soon as one of these keys has been pressed and the vote registered for one candidate for the said office; for the prevention of the simultaneous operation of more than one key corresponding with the same office on the different tickets; to permit the voting for several candidates for the same office when this is required by reason of the fact that the same section or political division is entitled to be represented by several officials, as in the case of county commissioners; for voting on questions independent of the election of candidates—as, for instance, on amendments to the constitution, the issuing of bonds, &c. Provision is also made for registering the total vote cast, as well as the individual vote for each candidate, also for unlocking the mechanism and returning it to its normal position automatically as soon as the voter leaves the booth, as well as other features, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a rear view of the voting-machine, partly broken away, the back plate, carrying the individual-counters or vote-registering devices, being removed. Fig. 2 is a front elevation of the mechanism, partly broken away to disclose the individual-counters and the resetting mechanism. Fig. 3 is a cross-section taken through the case on the line X X, Fig. 1. Fig. 4 is a fragmentary section showing two push-keys, their counters, locking-slides, and connections, the parts being shown on a larger scale than in Fig. 3, one key being operated and the other in the normal position. Fig. 5 is a rear view of the integral or front locking-slide and two push-keys in the position corresponding with Fig. 4. Fig. 6 is a similar view showing the auxiliary or sectional locking-slide. Fig. 7 is a fragmentary view of these locking-slides shown in connection with the total-counter. Figs. 8 and 9 illustrate two positions of the releasing mechanism operated from the door of the booth. Fig. 10 is a horizontal section taken through the casing of the machine and looking down upon the straight-ticket push-key. Fig. 11 is a vertical section illustrating the same in side elevation. Figs. 12 and 13 illustrate the mechanism for voting when there is a number of candidates for the same office on each ticket, as county commissioners. Fig. 14 is a horizontal section, and Fig. 15 a vertical section, taken through the same mechanism, the parts being shown on a larger scale. Fig. 16 is a perspective detail view illustrating features of the same construction viewed from the rear. Figs. 17 and 18 also illustrate details of the same construction. Fig. 19 is a perspective view of the booth, showing the machine in position, both doors being open. Fig. 20 is a rear view of the machine in perspective. Fig. 21 is a horizontal section taken through the booth above the machine, showing its connection with the door. Figs. 22 and 23 show in detail the locking-slide mechanism for the "amendment" and "appropriation" keys. Figs. 24, 25, and 26 illustrate the counter mechanism in detail and on a larger scale. Fig. 26 is shown on a scale larger than Figs. 24 and 25. Fig. 27 is a sectional view in detail illustrating the means for returning the straight-ticket rock-shafts to their normal positions. Fig. 28 is a perspective view in detail of a locking-slide employed in connection with the mechanism.

Fig. 29 is a sectional detail illustrating the means for locking the front and rear plates together, the parts being shown on a larger scale.

Similar reference characters indicating corresponding parts in the views, let the numeral 5 designate the front plate of the voting-machine case, 6 the sides, and 7 the rear plate, hinged to one side, as shown at 8, and connected with the other side by a fastening device, as shown at 9. To the front of the case is attached exteriorly vertical metal strips 10, between which are placed the tickets 12, which are covered by glass plates 13. Each metal strip 10 is provided with openings through which pass the individual push-keys 14, which are arranged one above another in a vertical series for each ticket. The candidates for the same office on the several tickets are arranged in horizontal series, the corresponding push-keys 14 being similarly arranged. These push-keys protrude considerably from the front part of the case (see Figs. 3 and 4) and are provided with bevel-faced notches 14^a, which are concealed by stationary guide-thimbles 15, attached to the case, surrounding the keys. To the inner extremity of each key 14, which is wedge-shaped, as shown at 14^c, is connected one extremity of a link 16, whose opposite extremity is connected with the long arm of a bell-crank lever 17, which is fulcrumed on a vertical rod 18, extending lengthwise of the case from top to bottom and journaled in brackets 19. The short arms 17^c of the levers 17 project through slots 20^a, formed in locking-slides 20, which occupy a horizontal position and are provided with openings 20^c, through which a horizontal series of push-keys 14 pass. Hence when any key 14 is pushed inwardly, as shown at the right of Fig. 4, in the act of voting for individual candidates, the lever 17 is actuated, shifting the slide 20 toward the left, referring to Figs. 1, 3, 4, and 5, since the lever normally engages the slide at the left-hand extremity of the slot 20^a. As the slide 20 is shifted it enters a notch 14^a of the actuated push-key and moves to a position in front of the shoulders 14^d of all the idle push-keys in the same horizontal series, thus locking the actuated key against the return movement and the idle push-keys against inward movement. As soon as the slide 20 is actuated, as aforesaid, its left-hand extremity is engaged by a dog 21, which enters a recess 20^d, formed in the slide and locks the latter against return movement. The extremity of the slide adjacent the dog 21 is provided with a stem 20^g, surrounded by a coil-spring 22, one extremity of which engages a shoulder on the slide, whereby the other extremity bears against the lower arm of the dog, which is provided with a stud 21^a for the purpose. This dog is fulcrumed on the plate 5 at 23. The spring 22 is compressed by the movement of the slide, and as soon as the dog is lifted out of the recess 20^d, as hereinafter explained, the recoil of the spring actuates the slide to return it to its normal position. This slide is provided with a recess 20^h, which straddles the flat wedge-shaped extremity 14^c of each inactive key 14 when the slide is moved to the locking position. As the key 14 is operated, as shown at the right in Fig. 4, the lever 17 is forced against a dog 24, provided with three prongs 24^a of unequal length, which acts on the counter 25 and registers a vote, as hereinafter explained more in detail. As any slide 20 is actuated in the operation of voting, as just explained, it acts on a bell-crank lever 26, fulcrumed on the case at 27, to force a vertical bar 28 downwardly against a total-counter 25 and register a vote independently of the registration at the individual-counters 25. The slides 20 are arranged in sets of three with reference to the levers 26. The upper and lower slides of the set are provided with rigid arms 20^j, having projections 20^k, each of which is adapted to act on the lever 26. The central slide is also provided with a suitable projection 20^k, adapted to act on the lever. Whichever slide 20 of this set or any other set is first operated by the voter acts on the arm 26^a of the lever to throw the other arm 26^c downwardly, and the arm 26^c being connected with the bar 28 the latter is forced downwardly against the counter 25, as aforesaid. When this is effected, the lever and the bar are held in the actuated position until the operated slide 20 is released. It is evident that the bar 28 when acted on by one lever 26 actuates all the other levers 26 connected therewith, there being a lever 26 for each set of three slides 20. After the voter has pushed the first key 14 and operated one slide 20 the lever 26 and the bar 28 are operated, and subsequently the slides all move idly so far as the levers 26 are concerned, since there is sufficient clearance between the slide extremities and the lever-arms 26^a to permit the slides to perform their functions without touching the levers. Hence no matter how many keys 14 are operated by the voter the total-counter 25 is only once actuated.

The back plate 7 of the case is provided with glass-covered openings or slots 7^a, through which the count indicated by the registers may be observed. The back of the case is also equipped with tickets 12 to correspond with those on the front plate. The rear plate 7 of the case is normally concealed while the voting is in progress by a door 30, hinged to the booth. (See Fig. 20.)

It must be understood that in voting mixed tickets the keys 14, termed "individual" push-keys in this specification, are pushed singly, also that every time any one of these keys is pressed all the other keys in the same horizontal series or those corresponding with the same office on the several tickets are locked against movement by the slide 20. The slides 20 are held in place by bars 31, which are secured to the inner surface of the front plate 5 and grooved adjacent the plate to receive

the slides. These bars are open, as shown at 31ª, to permit the entrance of the keys and, as shown at 31ᶜ, to allow the arms 17ᶜ of the levers 17 to pass through. Each bar 31 is grooved on the side opposite the slide 20 to receive the auxiliary or sectional locking-slide, composed of parts 32, whose extremities are semicircular, as shown at 32ª. The adjacent extremities 32ª of any two sections 32 are normally adapted to surround the inner wedge-shaped extremity 14ᶜ of the key. Each slide extremity 32ª is provided with a tongue 32ᶜ, adapted to be acted on by the wedge 14ᶜ as the key is operated, whereby the slide-sections 32 are separated, as shown at the right in Fig. 6. When any key 14 is actuated to separate the slide-sections, all of the adjacent extremities of the other sections or members belonging to the same slide are brought into contact with each other around the wedge-shaped extremities of the other keys in the same horizontal series. In other words, when the sectional slide is expanded by any key no further expansion is permitted, its expansive capacity being exhausted by the operation of one key. Hence this slide forms an additional lock against the operation of any key 14 in the same horizontal series after one key of this series has been pressed; but its special function is to prevent the simultaneous operation of a plurality of keys in the same horizontal series. Since only sufficient expansion is allowed for the complete operation of one key, if an attempt is made to push two keys, for instance, at the same time neither will be allowed sufficient movement to perform its function or actuate the counter. These sectional slides are held in place within the guide-grooves of the bars 31 by means of the bracket-plates 19, heretofore mentioned. Each slide member 32 is provided with a slot 32ᵈ to allow the lever-arm 17ᶜ to pass therethrough in the performance of its function. Heretofore the operation of the push-keys 14 has been explained more particularly with reference to the voting of mixed tickets or for candidates on different tickets, requiring the operation of the keys 14 singly or individually. In the voting of straight tickets the keys perform the same function; but instead of operating them individually all of the keys in the same vertical series or those corresponding to all the candidates on any ticket may be simultaneously operated through the instrumentality of mechanism which will now be described.

The straight-ticket push-keys 33 are arranged in a horizontal series at the top of the case. (See Fig. 19, also Figs. 11 and 12.) To the outer extremity of each key 33 is fulcrumed, as shown at 34, a lever 35. The short arm 35ᶜ of this lever is connected with a link 36, whose opposite extremity is pivoted to a lug 38 on the case, as shown at 37. The inner extremity of the key is surrounded by a thimble 39, fast on the front plate of the case, and is adapted to pass through a suitable opening formed in the said plate. The inner extremity of the key 33 is provided with a lug or projection 33ª, to which is pivotally attached one extremity of a link 40, whose opposite extremity is connected with a lever-arm 41, fast on a spindle 42, mounted in brackets 43, secured to the inner surface of the front plate. On the spindle 42 is made fast a gear 45, meshing with a pinion 44, fast on the upper extremity of a vertical rock-shaft 46, which is journaled in the flanges 19ª of the brackets 19 heretofore mentioned. Each rock-shaft 46 is provided with a series of dogs 47, which are fast thereon, there being one dog for each lever 17. These dogs are arranged in front of the levers. (See Fig. 1.) Hence it will be understood that if a lever-arm 35 be grasped by the voter and turned in the direction indicated by the arrow in Fig. 11 a rock-shaft 46 will be actuated through the instrumentality of the gear 45 and the pinion 44, resulting in operating the entire vertical series of push-keys through the medium of the dogs 47, acting on the long arms 17ª of the levers 17. As all the keys 14 in any vertical series are actuated, as described, the integral locking-slides 20 and the slide composed of the members 32 are all actuated to lock the keys as effectually as when the keys 14 are individually operated in the voting of mixed tickets, as heretofore described.

When a complete set of candidates has been voted for either by pushing the keys 14 individually or by voting a straight ticket and simultaneously actuating all of the keys 14 in any vertical series, all of the slides 20 will be locked by the dogs 21, as heretofore explained. A vertical releasing-bar 48 is located immediately in the rear of all the dogs 21 and provided with forwardly-projecting studs 48ª, one of which is located immediately below each lever 21. A horizontal bar 49, held in place by guide-straps 50, is utilized in reversing the shafts 46, each of which is provided with a dog 51, projecting through a slot 49ª, formed in the bar 49. The operation of the bars 48 and 49 to perform the releasing and reversing functions, respectively, will be explained after further explanation of the mechanism to be simultaneously actuated.

When there is a number of candidates for the same office on each ticket, as when a single section or political division is entitled to be represented by several officials of the same rank, as county commissioners, each elector is entitled to vote for the several officials. The mechanism for accomplishing this object will now be described, assuming that there are three candidates for the office of county commissioner to be voted for on each ticket. These candidates are voted for by operating push-keys 52, which, as shown in the drawings, comprise the three horizontal series of keys at the bottom of the case. The construction and arrangement of this mechanism must be such that each elector may vote for any three persons on the several tickets, but no more. These keys 52 are surrounded by thim-

bles 15 and enter openings formed in the front plate of the case, the same as the keys 14. The inner extremity 52^a of each key is cone-shaped. In front of this part the key is circumferentially grooved to form a neck 52^c, provided with a shoulder 52^d. This neck 52^c is rearwardly curved to the base of the cone 52^a. To the inner extremity of the key, which is provided with a flat lug for the purpose, is pivotally connected one extremity of a link 53, whose opposite extremity is connected with a lever 54, fulcrumed on the shaft 18, which is continued downward from the body of the machine. Beyond the fulcrum the lever is provided with a projection 54^a, adapted to engage a vertical bar 55, attached transversely to three parallel horizontal slides 56 in any suitable manner, as by rivets 57. There is a bar 55 for each vertical series of push-keys 52 and a lever 54 for each push-key of the series. Each bar 55 is provided with a recess 55^a for each lever 54, and the cam extremity 54^a of the lever enters this recess and actuates the bar, carrying the three slides 56 toward the left, referring to Figs. 1, 8, 9, 12, 13, and 14. To the extremities of the slides 56, farther to the left, is attached a plate or bar 58, which is connected by means of a link 59 with a lever 60, which is provided with a dog 62, stationary thereon, and a dog 63, pivoted thereon and engaged by a spring 64. These dogs are adapted to engage teeth formed on the upper and lower edges, respectively, of a horizontal bar 65, fast on a vertical plate 66, secured to three horizontal slides 67, located adjacent the front plate of the case. Each of these slides 67 is provided with elongated openings 68, through which all of the keys 54 in the same horizontal series pass. The slides 67 are held in place by bars 69, which are provided with front grooves to receive the said slides. Each slide 56 engages a rear groove or way formed partly in two adjacent bars 69. The slides 56 are located in a plane in the rear of the slides 67. The bar 66, carrying the slides 67, is connected with one extremity of a coil-spring 70, whose opposite extremity is secured to a stationary pin 71, fast on the front plate of the case. When the slides 67 are at their limit of movement toward the right, (see Figs. 1, 11, and 12,) the spring 70 is under tension, having a tendency to draw the slides toward the left, the dog 62 engages the ratchet-tooth of the part 65 farthest to the left and locks the slides 67 from movement in response to the spring's tension, and a coil-spring 72, connected with the upper extremity of the lever 60, holds the dog 62 in this position, the dog 63 being normally disengaged from the ratchet-teeth of the part 65. As any key 52 is actuated a lever 54 is thrown to the position shown in dotted lines in Fig. 14, its cam extremity 54^a carrying the slides 56 toward the right. This movement actuates the lever 60 sufficiently to disengage the dog 62 from the ratchet 65 and cause the dog 63 to engage the said ratchet. During the pushing of a key 52 a counter 25 is actuated. This counter is of the same construction as the counters actuated by the keys 14 and registers a vote. As soon as this occurs the opposite or cam extremity of the lever, by virtue of its eccentric construction, disengages the bar 65, allowing the slides 56 to return to their normal position by virtue of the recoil of the spring 72, acting through the medium of the lever 60 and the link 59. The dog 62 of the lever is now brought again into engagement with the ratchet 65, the dog 63 being disengaged therefrom; but the parts are so arranged that during the operation described the spring 70, acting on the bar 66, moves the slides 67 toward the left the distance of one tooth on the ratchet 65. Hence when the dog 62 reëngages the ratchet it is one tooth farther to the right than its original position. When the key 52 reaches its normal limit of movement, it, together with the lever 54, is locked in this position by a spring-held arm 73, movably mounted on a vertical rock-shaft 74. When the lever reaches the dotted-line position in Fig. 14, a pin 54^c thereon engages a notch 73^a in the lever, and the spring 75 actuates the arm sufficiently to cause the notch of the arm to engage the pin, thus performing the locking function stated. In the meantime each locking slide has traveled one-third of the distance toward the left necessary to bring the slide immediately in the rear of all the shoulders 52^d of all the idle keys 52 in the same horizontal series, assuming, as aforesaid, that three candidates only are to be voted for. The operation resulting from the pushing of a key 52, just described, is repeated until three keys have been pressed, the slides 67 traveling one ratchet-tooth toward the left at each key-pushing act and retaining this position, while the slides 56 return each time to their normal position as soon as the vote is registered. The slides 67 are now in position to lock from operation all the keys 52 which have not been operated, since the part of each slide 67 immediately to the right of each opening 68 is brought in front of a shoulder 52^d of a key.

To insure proper working of the mechanism just described, it is necessary to make it impossible to operate a number of keys simultaneously, since if three keys were pushed at the same time the slides 67 would only travel one ratchet-tooth toward the left, the same as when a single key is operated. In other words, the desired number of votes would be counted by the operation of the three keys; but the idle keys would not be locked.

To prevent the simultaneous operation of keys 52 in the same vertical series, vertical slides 76 are employed. These slides are provided with semicircular extremities 76^a, which normally straddle the conical parts 52^a of the keys. One of these slides is interposed between each two keys, and while sufficient movement is allowed to permit the operation of one key if an attempt is made to push two keys, for instance, at once the slide locks

both keys from sufficient movement to act on the counters. In the regular operation of the device these slides are raised and lowered by virtue of cam-slots 56^a, formed in the slides 56. The slides 76 are provided with pins 76^c, which enter the slots 56^a and engage inclined walls 56^c of the said slots. As the slides 56 are moved toward the left by the operation of a key, as heretofore described, the inclined wall 56^c of the slots will cause the slides 76 to move upwardly, and when the slides 56 move in the opposite direction or toward the right the slides 76 will also return to their normal position. The slides 76 engage the neck 52^c of the operated push-key and where the said neck is substantially the same size as the cone-shaped part 52^a previously engaged. Hence the slides 76 are permitted substantially the same movement as before, so that one key or more in the same vertical series may always be actuated until they are locked by the long slides 67, as heretofore explained.

To prevent the movement of more than one key at the same time in the same horizontal series, horizontal slides 77, having semicircular extremities 77^a, are employed. These slides 77 straddle the conical portion 52^a of a key 52. These slides are so constructed with reference to the keys that a single key in the same horizontal series may be actuated, the slides 77 moving sufficiently to permit the necessary movement of the key; but if an attempt is made to operate two or more keys simultaneously the slide 77, interposed between the two keys, will prevent the operation by wedging between the two cone-shaped parts 52^a of the keys.

The slides 76 and 77 operate in different vertical planes and are held in place by plates 78, located in the rear of the slides. The slides 77, as well as the slides 76, are engaged by the necks 52^c of the actuated push-keys; but the size of these necks is such as to allow substantially the same movement of the slides as before.

The levers 54 of the actuated push-keys are released through the instrumentality of vertical rock-shafts 74, there being one of these shafts for each vertical series of keys. The locking-arms 73 are loosely mounted on their shafts, as heretofore explained. The upper extremity of each shaft 74 is provided with a crank 79, having a pin 80 passing through a slot 81, formed in a horizontal bar 82. Fast on each shaft 74 is a number of cams 83, adapted to engage the lever-arms 73. The extremity of the bar 82 farther to the right is connected with a spring 84, whose opposite extremity is secured to a stationary support. The other extremity of the bar 82 is connected with one arm of a bell-crank lever 85, fulcrumed on the case at 86, and whose opposite arm is connected with the lower extremity of a releasing-bar 87, whose opposite extremity is connected with an arm 88^a of a bell-crank lever 88, fulcrumed on the case at 89. The other arm 88^c of this lever engages a dog 90, mounted on a rod 91, connected by means of a link 92 (see Fig. 21) with a lever 93, fulcrumed at 95 on a stationary bar 94, attached to the booth adjacent the exit-door. The opposite arm 93^c of this lever is curved and engages a roller 96, mounted on the inwardly-projecting arm 97 of a transverse bar 98, attached to the exit-door 99 of the booth. When the ratchet 65 reaches its forward limit of movement toward the left, it is engaged by an auxiliary locking-dog 100, mounted on a supporting-dog 101, pivoted on the case at 102. The dog 100 enters a recess 65^c, formed in the ratchet-bar, and locks the said bar and its connections against movement toward the right. The bar 87 is connected with the vertical bar 48 by a lever 103, fulcrumed on the case at 104. The upper extremity of the bar 87 is connected with a bell-crank lever 105, whose opposite arm engages a stop-pin. A bell-crank lever 106 is fulcrumed on the case at 107. One arm of this lever is connected with the vertical bar, while its other arm projects downwardly to a position immediately at the left of a pin 65^a on the ratchet 65. (See Figs. 8 and 9.) A lever 108 is fulcrumed on the case at 109. One arm of this lever is pivotally connected with the bar 48, while its other arm engages a stop 58^a, formed on the bar 58.

Two pairs of additional keys 14 are shown in the drawings to be employed in voting on questions aside from the election of candidates. This additional mechanism is shown at the left in Fig. 1 and at the right of Fig. 2. The pair of keys located at the upper part of these figures will for convenience be referred to as the keys employed in voting for and against amendments, while the keys located farther down on the sheet will be referred to as the keys employed in voting for and against appropriations. The keys 14, together with the locking-slides 32, the levers 17, and the counters 25, are the same in construction as the corresponding parts heretofore described. Hence their description need not be repeated in detail. The front locking-slides 20, however, are slightly different in construction from the slides 20 employed in connection with the keys 14 in the body of the machine. These slides are illustrated in Figs. 22 and 23. The lower slide, or that for locking the appropriation-keys, is shown in Fig. 22. The coil-spring 22, engaging the extremity of this slide farther to the left, bears against a stationary stop A, through which the pin 20^g passes. The opposite extremity of this slide is provided with a shoulder 20^j, adapted to be engaged by the dog B when the slide is in the locking position. This dog is actuated by a spring C. The upper locking-slide 20, or that used in connection with the amendment-keys, is shown in Fig. 23. The extremity of this slide farther to the left is the same as that just described. The opposite extremity is provided with a shoulder 20^k,

adapted to be engaged by a dog D, actuated by a spring E. For releasing purposes this dog is engaged by an upwardly-curved arm F, fast on the bar 49 and actuated by the lever 105.

The machine when in use is mounted in a booth 110, provided with an entrance-door 111 and an exit-door 99. (See Fig. 19.) As the voter enters the booth the door 111 will close automatically behind him by virtue of any ordinary door-closing mechanism, which need not be described. If he desires to vote a straight ticket, he grasps the lever 35 at the top of the machine above the ticket he wishes to vote and moves it in the direction indicated by the arrow in Fig. 11, whereby the key 33 is forced inwardly in the manner heretofore described. The movement of this shaft actuates all the keys 14 in the same vertical series, the said keys being retained in the actuated position by the slides 20, which also lock the idle keys against movement. If the person entering the booth desires to vote a mixed ticket, he pushes the keys 14 adjacent the names of the candidates on the different tickets individually until he has voted for a full set of candidates. In either case the slides 20 are held in the locking position by the dogs 21. The person in the booth then proceeds to vote for the commissioners by pushing three keys 52 in succession, whereby the locking-slides 67 are held in the actuated position by the dog 100 engaging the ratchet-bar 65, the actuated keys 52 being locked in the operated position by the arms 73 engaging the pins 54^c of the levers 54. Finally, if there is an amendment or an appropriation question, or both, to be voted on at the election, the person in the booth pushes the operating key or keys 14 located at the right of the machine. (See Fig. 14.) The person in the booth then opens the exit-door 99 and passes out of the booth. As he opens this door the roller 96, acting on the lever 93, throws it to the dotted-line position (see Fig. 21) and actuates the bar 91 in the direction indicated by the arrow in Figs. 1, 8, and 9. This movement of the bar 91 actuates the lever 88 and moves the parts connected therewith to the position shown in Fig. 9. This operation actuates the lever 105 sufficiently to return the rock-shaft 46 to its normal position, if a straight ticket has been voted, through the instrumentality of the bar 49 and a dog 51, with which each rock-shaft 46 is provided, as aforesaid. The movement of the lever 88 also moves the bar 87 downwardly sufficiently to actuate the lever 103 and raise the vertical bar 48, whereby all the dogs 21 are moved out of the notches 20^d of the slides 20, after which all of these slides are returned to their normal position through the instrumentality of the springs 22 acting in conjunction with a spring 113, connected with the top of the total-counting bar 28. This spring also raises the said bar and returns all the levers 62 to their normal position. The slides 20 during their movement toward the left in response to the recoil of the springs 22 act on the arms 17^c of all the levers 17 connected with the actuated push-keys 14 and return the said levers, and consequently the actuated push-keys, to their normal position. It will be observed by referring to Fig. 1 that the bar 28 has been actuated to register a vote on the total-counter by pushing the middle key 14 of the uppermost horizontal series of keys. Furthermore, the downward movement of the bar 87 actuates the lever 85 and moves the bar 82 sufficiently to actuate all of the rock-shafts 74 and release the actuated keys 52 by virtue of the action of the cams 83 on the arms 73, whereby the levers 54, connected with the actuated keys 52, are returned to their normal position by springs 114. This movement of the said levers forces the actuated keys 52 outwardly to their original position. The cams 83 are so arranged on the shafts 74 with reference to the arms 73 that no two cams engage their respective arms at exactly the same time, the cams being arranged to act successively on the arms in order to allow the actuated keys to return one at a time to their normal position. This is necessary by virtue of the arrangement of the slides 76 and 77. As only one key can be pushed inwardly at the same time, it follows that this must hold true with reference to their return movement. The said cams are so arranged, however, that the interval between the unlocking of the successive keys is imperceptible, and it is therefore not considered necessary to illustrate this feature in the drawings. Finally the downward movement of the bar 87 acts on the dog 101 and disengages the dog 100 from the ratchet-bar 65. The upward movement of the bar 48 actuates the lever 108 and forces the bar 58 and its attachments toward the left, (see Fig. 9,) actuating the lever 60 and disengaging the dog 62 from the ratchet 65. This is necessary, since the dog 62 is stationary on the lever. The depending arm of the lever 106 then acts on the stop 65^a of the ratchet-bar 65 and returns the said bar, together with the slides 67, to their normal position. The amendment-keys are released by the lever 105, which in moving the bar 49 toward the left disengages the lever D from the shoulder 20^k of the slide, (see Fig. 23,) and the spring 22 returns the slide to its normal position. The appropriation-slide 20 is released by the engagement of a pin 48^a on the bar 48 with the dog 50 as the bar is moved upwardly. The spring 22 then returns this slide to its normal position. As the voter passes out of the exit-door the latter acts on a total-counter H, located above the door and provided with an arm J, projecting into the path of the door as it opens outwardly. The total-counter 25 within the machine and shown at the lower right-hand corner of Fig. 21 is a check upon the exposed counter H in case the latter should be tampered with. After the voter leaves the booth the exit-door

closes and locks automatically, so that it can only be opened from the inside. The booth and machine are then ready for the next voter.

After the voting is completed and the record made by the counters has answered its purpose all of the counters 25 mounted on the rear plate 7 except the amendment and appropriation counters are simultaneously returned to their normal or zero position through the instrumentality of worm-shafts K, journaled in suitable bearings mounted on the front plate of the case and adapted to engage pinions 25^a, fast on spindles 25^c, upon which the counter-wheels 25^d are loosely mounted. The spindle 25^c is journaled in a bracket 25^g, secured to the rear plate of the case. Each counter-wheel is provided with a ratchet 25^j, actuated by a tooth 24^a on a dog 24. As shown in the drawings, there are three counter-wheels 25^d for registering units, tens, and hundreds, respectively. The operation of these wheels in detail will not be explained, as nothing is claimed thereon. It will be necessary, however, to note that their arrangement is such that every time the units-wheel turns once around the tens-wheel is turned one ratchet-tooth and every time the tens-wheel makes a complete revolution the hundreds-wheel is turned one tooth. The counter-wheels turn in the direction indicated by the arrow in Fig. 26 and are locked against turning in the opposite direction by a retaining-spring. Each wheel 25^d is recessed to receive a spring-actuated pin 25^n, which engages a groove 25^o, formed in the spindle 25^c. These pin-holes pass through the zero characters on the face of the wheels. The pins allow the wheels to turn freely in the direction indicated by the arrow in Fig. 26, as will be readily understood, since the wall of the groove 25^o is inclined on one side for the purpose. When it is desired to return all the wheels to the zero position, the turning of the spindle in the same direction through the instrumentality of the worms aforesaid will accomplish this purpose, since the straight wall or offset of the groove 25^o will engage the pins as they are reached in the travel of the spindle in making one revolution. The first wheel whose pin engages the groove will travel along with the spindle until the pin of the next wheel is reached, after which both wheels will travel with the spindle until the third wheel is reached, after which the three wheels will travel together and the three zeros will all be in line on the wheels, which should be stopped to bring the zeros of all the counters in front of the openings 7^a of the rear plate 7. The worm-shafts K are simultaneously turned to accomplish this purpose through the instrumentality of a horizontal shaft L, journaled on the rear plate of the case and provided with bevel-pinions M, engaging similar pinions N, fast on the upper extremities of the worm-shafts K. Another pinion M on the shaft L engages a similar pinion R, fast on the lower extremity of a short spindle S, squared to receive the socket of a crank or other suitable turning device. (Not shown.) Access is gained to the machine for this purpose by opening the rear plate, which is hinged to the body of the machine, as heretofore explained.

The dog 101 is normally supported in the locking position by a spring T.

When the machine mechanism is returned to its normal position after voting, the bar 87, together with the lever 88 and their counters, is returned to its normal position by a spring W.

The front and rear plates 5 and 7 are locked together by means of a sliding rod 125, carrying pins 126, adapted to pass through registering apertures formed in interlocking lugs 127 and 128, (see Figs. 2 and 29,) formed on the front and rear plates, respectively. The lugs 127 are formed with tongues which enter grooves formed in lugs 128 and the registering apertures are formed in the engaging parts. The rod 125 is adapted to slide in guides 129, secured to the rear plate. This locking-rod is connected with a lock barrel or cylinder 130 by a link 131. The lock-barrel is mounted in the rear plate of the case and may be actuated to lock and unlock the machine by the proper person who has a key to fit the lock.

The bar 28 for actuating the total-counter 25 is provided with a recess 28^a, adapted to receive the bolt of a lock 135, the recess being arranged to register with the position of the bolt when the bar is in the normal or idle position, whereby a person holding the key to the lock may lock all the slides 20 connected with the bar, and consequently all the keys connected with said slides, against movement. This should be done as soon as the time for voting has expired.

The levers 17, with which the amendment and appropriation keys 14 are connected, are fulcrumed on short shafts 18^a, mounted on brackets 18^c, secured to the front plate 5 of the case.

Having thus described our invention, what we claim is—

1. The combination with a case and counting-registers, of push-keys for operating the registers, said keys being provided with notches and having shouldered inner extremities, a locking-slide having key-openings, and slots between the openings, levers connected with the keys at one extremity, their opposite extremities projecting into the slots of the slide, whereby as any key is actuated the corresponding lever shifts the slide to engagement with the notch of the actuated key, and the shoulders of the idle keys, the slots of the slide being of sufficient length to allow the slide the necessary locking movement while all the levers except that connected with the operated key, remain idle.

2. The combination of push-keys, individual-counters for the keys, a total-counter, locking-slides actuated by the keys, and a con-

nection between the total-counter and the slides, whereby the slide first actuated operates the total-counter, and the subsequent operation of a slide will not affect the counter, until the slide first actuated has been released.

3. The combination of push-keys, individual-counting registers for the keys, locking-slides, a connection between the keys and said slides, a total-register, an actuating-bar therefor, and levers connected with the bar and arranged to be actuated by the slides substantially as described.

4. The combination of push-keys, individual-counting registers actuated by the keys, a total-counting register, locking-slides arranged in groups, a bar for operating the said counter, levers connected with the bar, one arm of each lever projecting into the path of each slide of the group, as the slide is operated.

5. The combination of push-keys, individual-counting registers, actuated by the keys, a total-counting register, an operating-bar therefor, locking-slides arranged in groups of three, two of the slides having angular arms and the third a straight arm, and levers connected with the bar, each lever having an arm lying in the path of each arm of one of the groups of slides, whereby as any lever is actuated the total-counter is operated.

6. The combination of push-keys, individual-registers actuated by the keys, a total-register, an operating-bar therefor, locking-slides arranged in groups of three, two of the slides having angular arms, and the third a straight arm, levers connected with the bar, each lever having an arm lying in the path of each arm of one of the groups of slides, whereby as any slide is actuated, the total-counter is operated, and means for locking the slides in the actuated position.

7. The combination with a case, of push-keys, individual-counters operated thereby, locking-slides also actuated by the keys, a total-counter, an operating-bar therefor, bell-crank levers having one arm of each connected with the bar, while the other arm projects into the path of one or more slides, and means for locking the slides individually in the actuated position, whereby the total-counter-actuating means can only be operated once by each voter.

8. The combination of push-keys, locking-slides therefor, a vertical bar, levers connected with the bar and projecting into the path of the slides and means for locking the bar to prevent movement of the slides.

9. The combination of push-keys, individual-counters actuated by the keys, a total-counter, locking-slides actuated by the push-keys, a bar for operating the total-counter, bell-crank levers connected with the bar and projecting into the path of the slides, and means for locking said bar, whereby the slides as well as the push-keys are locked against movement.

10. In a voting-machine, the combination of a case and counting-registers, of a series of push-keys arranged one above another, levers connected with said keys, locking-slides for the keys, said slides being actuated by the levers, a rock-shaft having dogs engaging all the key-levers, means for actuating the rock-shaft, whereby all the push-keys in the same series are actuated, said means comprising a key, a lever connected with the outer extremity of the key, a gear connected with the inner extremity of the key, and a pinion fast on the rock-shaft and meshing with the gear.

11. In a voting-machine, the combination of a case and counting-registers, of a series of push-keys arranged one above another, levers connected with said keys, locking-slides for the keys, said slides being actuated by the levers, a rock-shaft having dogs engaging all the key-levers, means for actuating the rock-shaft whereby all the push-keys in the same series are actuated, said means comprising a key, a lever connected with the outer extremity of the key, a link connected with the inner extremity of the key, a gear, an arm fast on the gear and connected with the link, and a pinion fast on the rock-shaft and meshing with the gear.

12. The combination of a case and counting-registers, of a series of push-keys for operating the registers, a locking-slide apertured to receive the push-keys of the series, levers having one end of each connected with each push-key respectively, its other arm projecting through a slot formed in the locking-slide, the arrangement being such that as any key is pressed the slide is actuated by a lever to lock the push-keys, the slots of the slides to receive the levers being of such length as to allow the slide to move in response to the action of any lever without interfering with the idle levers, and suitable means for returning the slide to its normal position whereby the actuated push-key is returned to its normal position through the medium of the slide acting on the lever.

13. In a voting-machine, the combination with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for offices of the same rank on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series being composed of one key of each vertical series, the said slides being all connected together forming a sliding frame and provided with key-openings, means arranged to actuate the sliding frame step by step as each key is pushed until the number of actuated keys corresponds with the number of candidates for whom each person is entitled to vote, the openings in the slides being large enough to permit the necessary movement of the sliding frame, and suitable means for holding the sliding frame in the actuated position during its step-by-step progress.

14. In a voting-machine, the combination

with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for offices of the same rank on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series being composed of one key of each vertical series, the said slides being all connected together forming a sliding frame and provided with key-openings, means arranged to actuate the sliding frame step by step as each key is pushed until the number of actuated keys corresponds with the number of candidates for whom each person is entitled to vote, the openings in the slides being large enough to permit the necessary movement of the sliding frame, suitable means for holding the sliding frame in the actuated position during its step-by-step progress, a booth in which the machine is located, and means actuated from the exit-door of the booth for releasing the said holding means of the sliding frame.

15. In a voting-machine, the combination with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for offices of the same rank on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series of keys being composed of one key of each vertical series, the said slides being all connected together forming a sliding frame and provided with key-openings, means arranged to actuate the sliding frame step by step as each key is pushed until the number of actuated keys corresponds with the number of candidates for whom each person is entitled to vote, the openings in the slides being large enough to permit the necessary movement of the sliding frame, suitable means for holding the sliding frame in the actuated position during its step-by-step progress, a booth in which the machine is located, means actuated from the exit-door of the booth for releasing the said holding means of the sliding frame, and means also actuated from the exit-door of the booth for returning the sliding frame to its normal position.

16. In a voting-machine, the combination with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for offices of the same rank on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series being composed of one key of each vertical series, the said slides being all connected together forming a sliding frame and provided with key-openings, an actuating-spring connected with the sliding frame, means for locking the frame against the tendency of the spring to operate it, means connected with the push-keys for releasing the locking mechanism, permitting a step-by-step action in response to the spring, as the required number of keys is actuated, the openings of the slides being large enough to permit the necessary movement of the sliding frame.

17. In a voting-machine, the combination with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for offices of the same rank on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series being composed of one key of each vertical series, the said slides being all connected together forming a sliding frame and provided with key-openings, an actuating-spring connected with the sliding frame, means for locking the frame against the tendency of the spring to operate it, means connected with the push-keys for releasing the locking mechanism, permitting a step-by-step action in response to the spring, as the required number of keys is actuated, the openings of the slides being large enough to permit the necessary movement of the sliding frame, a booth, and means operated from the exit-door of the booth for finally releasing the sliding-frame-locking device, and returning the said frame to its normal position.

18. In a voting-machine, the combination with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for the same office on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series being composed of one key of each vertical series, the said slides being all connected together to form a sliding frame and provided with openings, an actuating-spring connected with the sliding frame, a device for holding the frame against the tendency of the spring to operate it, an auxiliary sliding frame connected with said locking device, levers connected with the push-keys and adapted to actuate said frame to release said locking device, and permit a step-by-step action in response to the spring of the sliding frame as the keys are actuated, the levers being constructed to release the auxiliary frame as soon as the key is actuated, the openings of the slides being of sufficient size to permit the necessary movement of the sliding frame, whereby all the idle keys are locked against movement.

19. In a voting-machine, the combination with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for the same office on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series being composed of one key of each vertical series, the said slides being all connected together to form a sliding frame and provided with openings, an actuating-spring connected with the sliding frame, a device for holding the frame against the tendency of the spring to operate it, an auxiliary sliding frame connected with said locking device, levers con-

nected with the push-keys and adapted to actuate said frame to release said locking device, and permit a step-by-step action in response to the spring of the sliding frame as the keys are actuated, the levers being constructed to release the auxiliary frame as soon as the key is actuated, the openings of the slides being of sufficient size to permit the necessary movement of the sliding frame, whereby all the idle keys are locked against movement, means for locking the levers of the actuated keys to prevent the return movement of the keys, a booth in which the machine is located, and means connected with the exit-door of the booth for releasing the levers allowing them to return together with the keys to their normal position.

20. In a voting-machine, the combination with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for the same office on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series being composed of one key of each vertical series, the said slides being all connected together to form a sliding frame and provided with openings, an actuating-spring connected with the sliding frame, a device for holding the frame against the tendency of the spring to operate it, an auxiliary sliding frame connected with said locking device, levers connected with the push-keys and adapted to actuate said frame to release said locking device, and permit a step-by-step action in response to the spring of the sliding frame as the keys are actuated, the levers being constructed to release the auxiliary frame as soon as the key is actuated, the openings of the slides being of sufficient size to permit the necessary movement of the sliding frame, whereby all the idle keys are locked against movement, a booth in which the machine is located, and means connected with the exit-door of the booth for actuating the auxiliary frame to unlock the sliding frame.

21. In a voting-machine, the combination with a casing and counting-registers, of a number of vertical series of keys, each vertical series corresponding with the number of candidates for the same office on a ticket, horizontal locking-slides for the several horizontal series of keys, each horizontal series being composed of one key of each vertical series, the said slides being all connected together to form a sliding frame and provided with openings, an actuating-spring connected with the sliding frame, a device for holding the frame against the tendency of the spring to operate it, an auxiliary sliding frame connected with said locking device, levers connected with the push-keys and adapted to actuate said frame to release said locking device, and permit a step-by-step action in response to the spring of the sliding frame as the keys are actuated, the levers being constructed to release the auxiliary frame as soon as the key is actuated, the openings of the slides being of sufficient size to permit the necessary movement of the sliding frame, whereby all the idle keys are locked against movement, a booth in which the machine is located, means connected with the exit-door of the booth for actuating the auxiliary frame to unlock the sliding frame, and means also connected with the exit-door of the booth for returning the sliding frame when unlocked to its normal position.

22. In a voting-machine, the combination with a casing, of push-keys and counting-registers, the latter being provided with spindles having pinions, worm-shafts each engaging all the pinions of all the counter-spindles in the same series, and means for operating a worm-shaft to simultaneously reset all the counters in the series.

23. In a voting-machine, the combination with a casing, of push-keys and a number of series of counting-registers, the latter being provided with spindles having pinions, a worm-shaft engaging the pinions of each register, and means for simultaneously operating all the worm-shafts whereby all the counters are simultaneously reset to the zero or any desired position.

In testimony whereof we affix our signatures in the presence of two witnesses.

GEORGE WILLIAM TROMMLITZ.
WILLIAM HENRY POWERS.

Witnesses:
A. J. O'BRIEN,
GRACE MYTINGER.