

S. LOE.

VOTING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 1.

TOTAL STRAIGHT VOTE		
STRAIGHT BALLOT	Republican	VOTE FOR ONE
STRAIGHT BALLOT	Democrat	
STRAIGHT BALLOT	Prohibition	
STRAIGHT BALLOT	Populist	
STATE BALLOT		VOTE FOR ONE
STRAIGHT STATE BALLOT	Republican	
STRAIGHT STATE BALLOT	Democrat	
STRAIGHT STATE BALLOT	Prohibition	
STRAIGHT STATE BALLOT	Populist	VOTE FOR ONE
Governor	Republican	
Governor	Democrat	
Governor	Prohibition	
Governor	Populist	VOTE FOR ONE
Independent		
Lieutenant Governor	Republican	
Lieutenant Governor	Democrat	
Lieutenant Governor	Prohibition	VOTE FOR ONE
Lieutenant Governor	Populist	

Fig. 1.

CITY BALLOT		
STRAIGHT CITY BALLOT	Republican	VOTE FOR ONE
STRAIGHT CITY BALLOT	Democrat	
STRAIGHT CITY BALLOT	Prohibition	
STRAIGHT CITY BALLOT	Populist	
STRAIGHT CITY BALLOT	Labor	VOTE FOR ONE
Mayor	Republican	
Mayor	Democrat	
Mayor	Prohibition	
Mayor	Populist	VOTE FOR ONE
Independent		
Treasurer	Republican	
Treasurer	Democrat	
Treasurer	Prohibition	VOTE FOR ONE
Treasurer	Populist	
Independent		
Comptroller	Republican	

COUNTY BALLOT		
STRAIGHT COUNTY BALLOT	Republican	VOTE FOR ONE
STRAIGHT COUNTY BALLOT	Democrat	
STRAIGHT COUNTY BALLOT	Prohibition	
STRAIGHT COUNTY BALLOT	Populist	
Member of Congress	Republican	VOTE FOR ONE
Member of Congress	Democrat	
Member of Congress	Prohibition	
Member of Congress	Populist	
Independent		VOTE FOR ONE
County Auditor	Republican	
County Auditor	Democrat	
County Auditor	Prohibition	
County Auditor	Populist	VOTE FOR ONE
Independent		
Sheriff	Republican	
Sheriff	Democrat	

ELECTORS		
STRAIGHT ELECTORS BALLOT	Republican	VOTE FOR ONE
STRAIGHT ELECTOR BALLOT	Democrat	
STRAIGHT ELECTOR	Prohibition	
STRAIGHT ELECTOR	Populist	
Elector	Republican	VOTE FOR SEVEN
Elector	Republican	
Elector	Republican	
Elector	Republican	
Elector	Republican	
Elector	Republican	
Elector	Republican	
Elector	Democrat	
Elector	Democrat	
Elector	Democrat	
Elector	Democrat	
Elector	Democrat	
Elector	Democrat	

Witnesses

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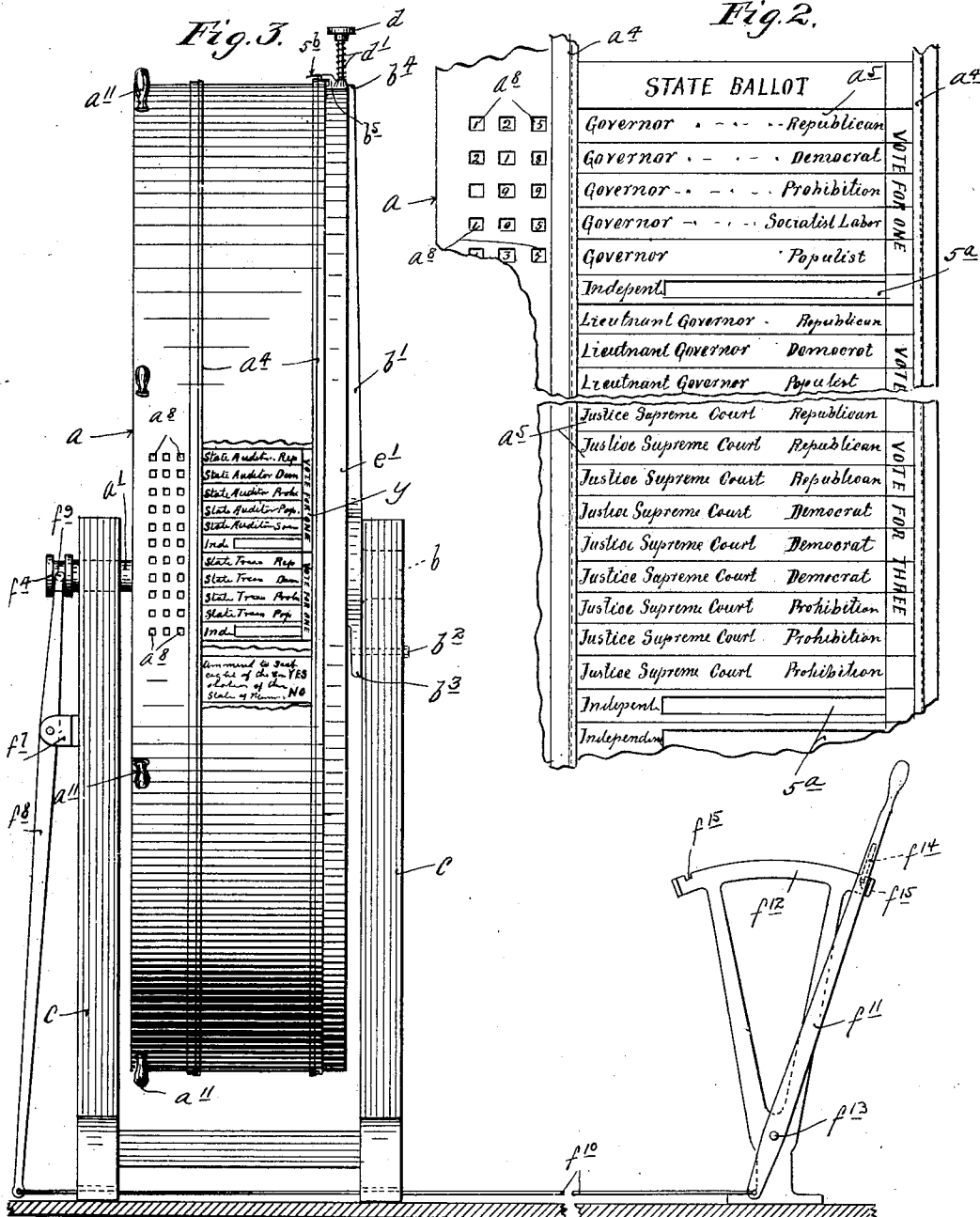
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9 Sheets—Sheet 2.



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No. 660,115.

Patented Oct. 23, 1900.

S. LOE.

VOTING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 3.

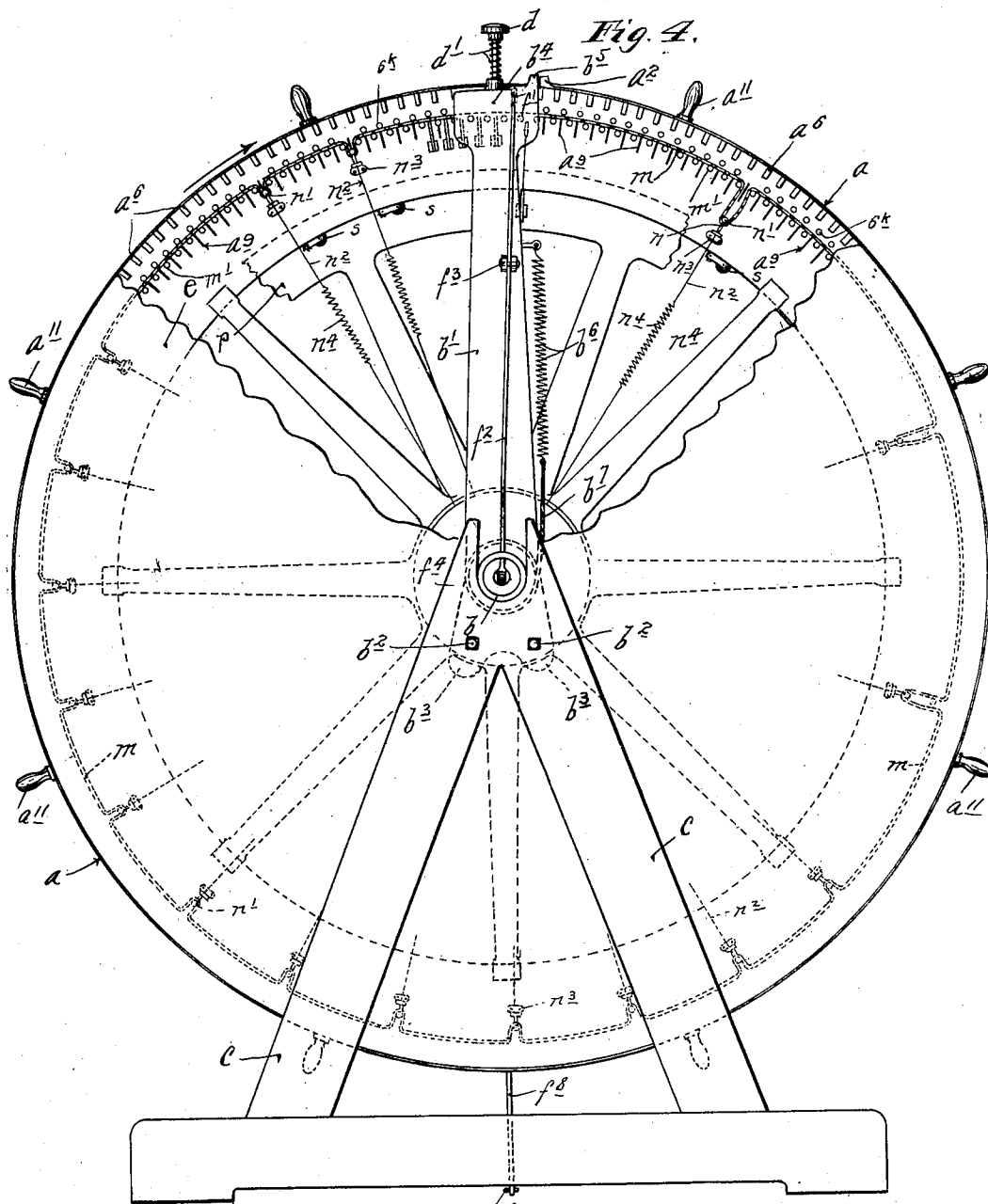
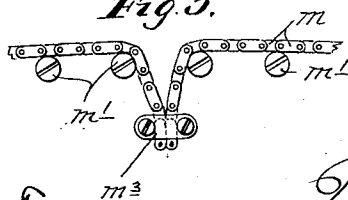


Fig. 5.



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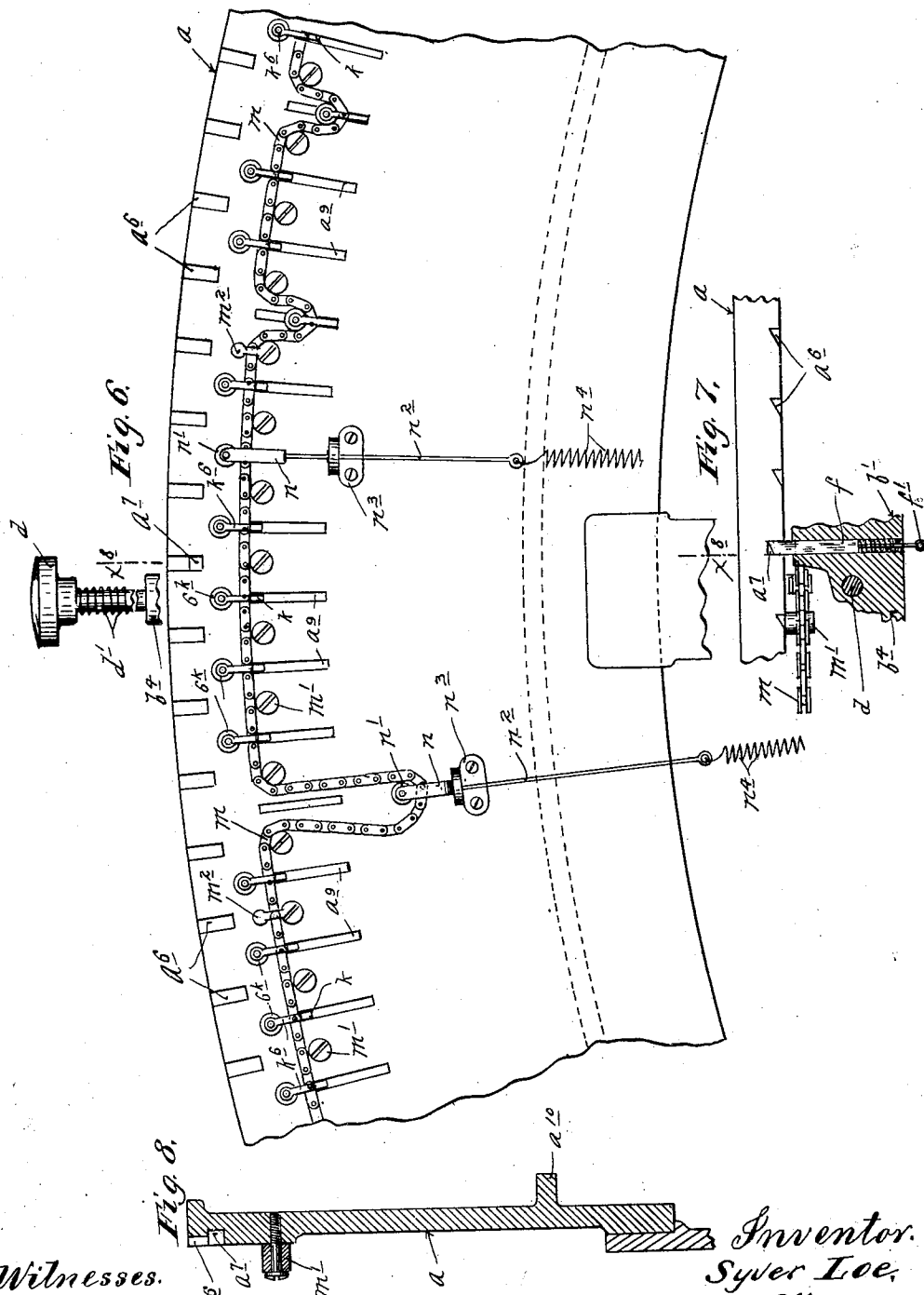
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(No Model.)

9 Sheets—Sheet 4.



Witnesses.
A. H. Opsahl.
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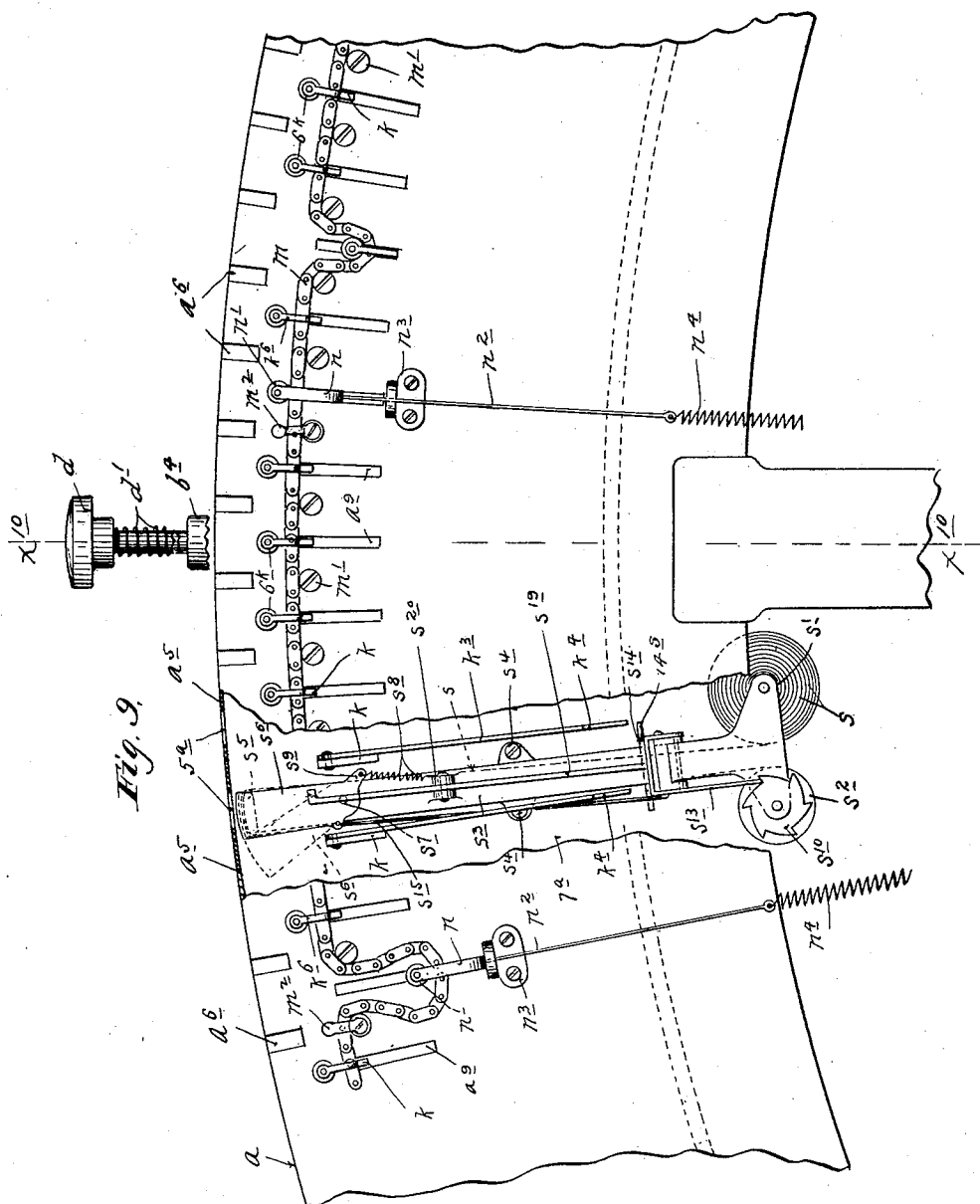
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(Application filed Dec. 18, 1899.)

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9 Sheets—Sheet 5.



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S. LOE.

VOTING MACHINE.

(Application filed Dec. 18, 1899.)

(No Model.)

9 Sheets—Sheet 6.

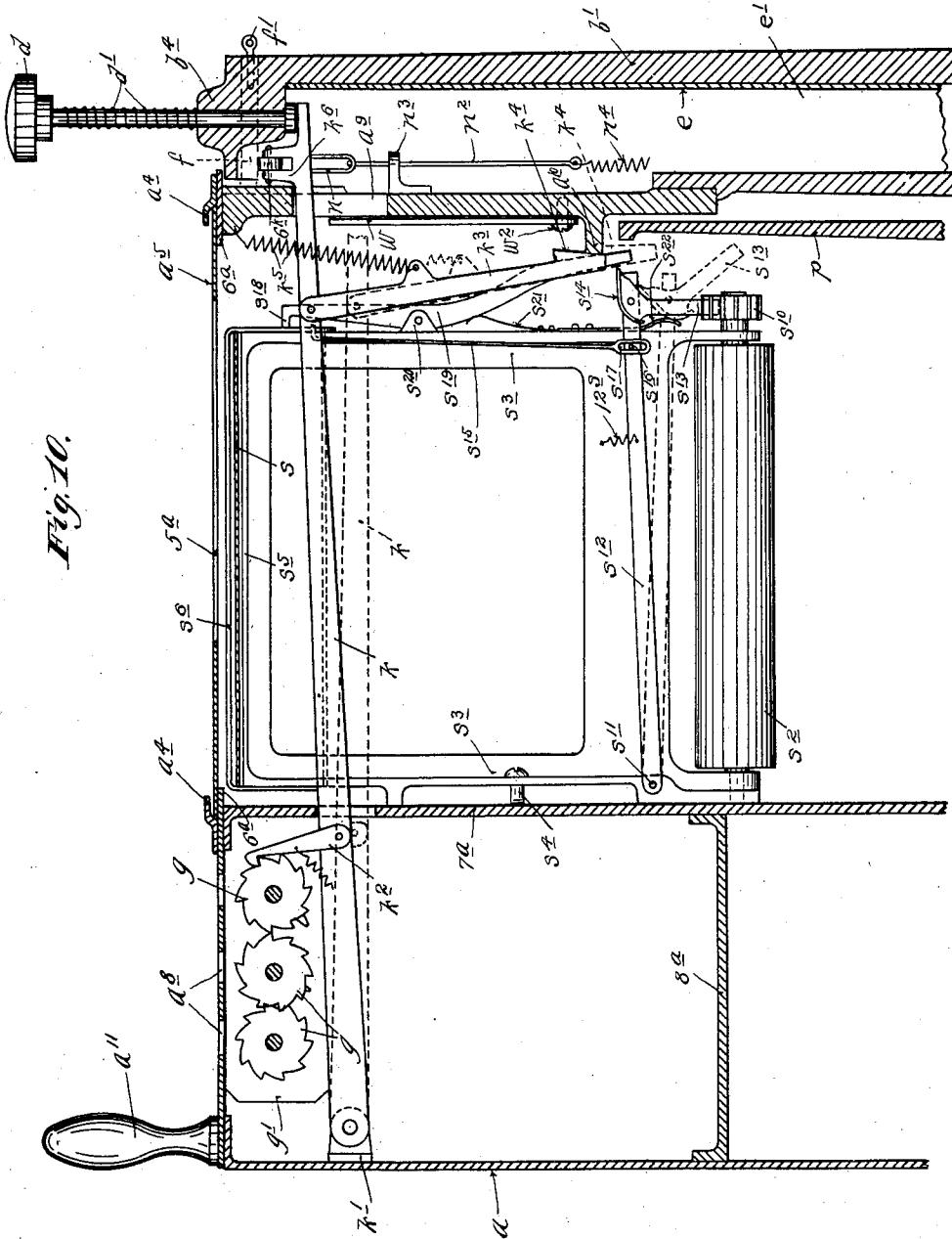


Fig. 10.

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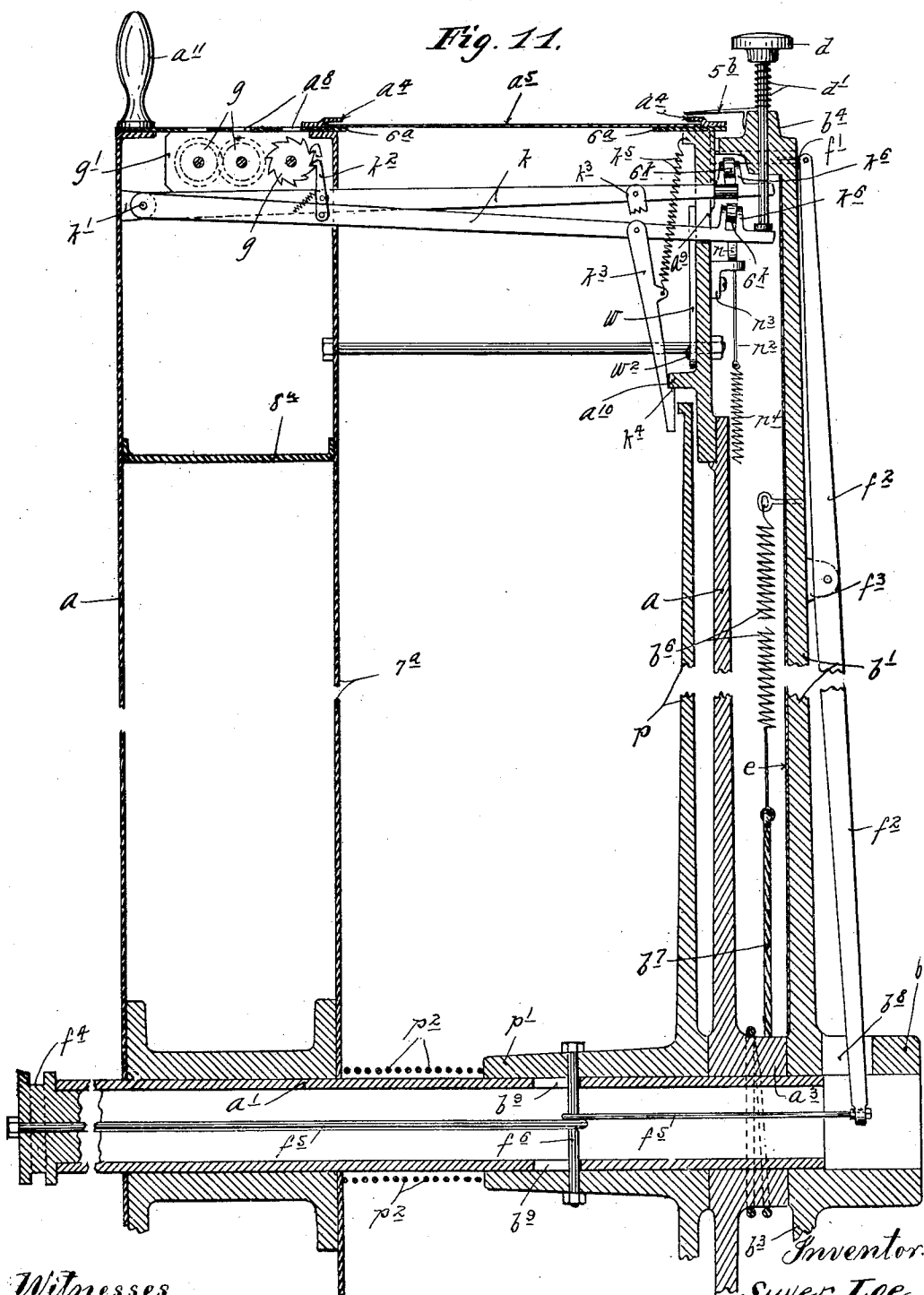
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(No Model.)

9 Sheets—Sheet 7.



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9 Sheets—Sheet 8.

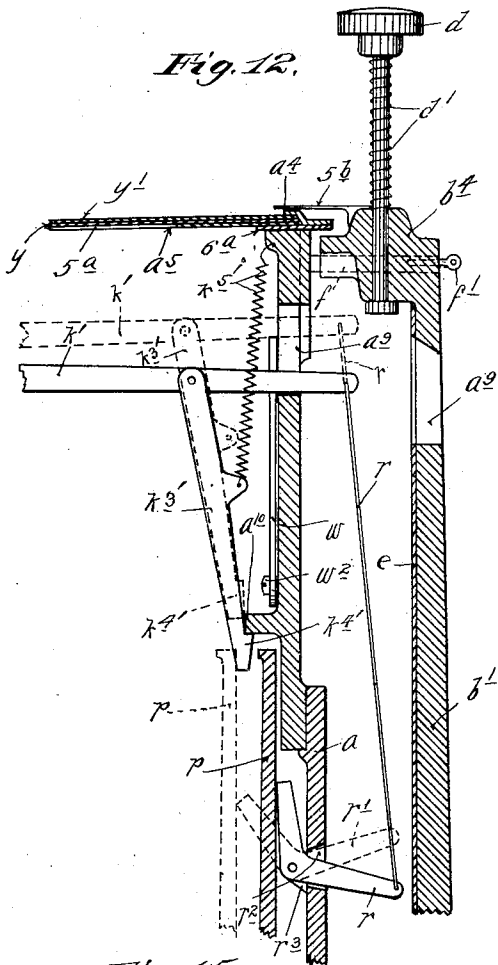


Fig. 12.

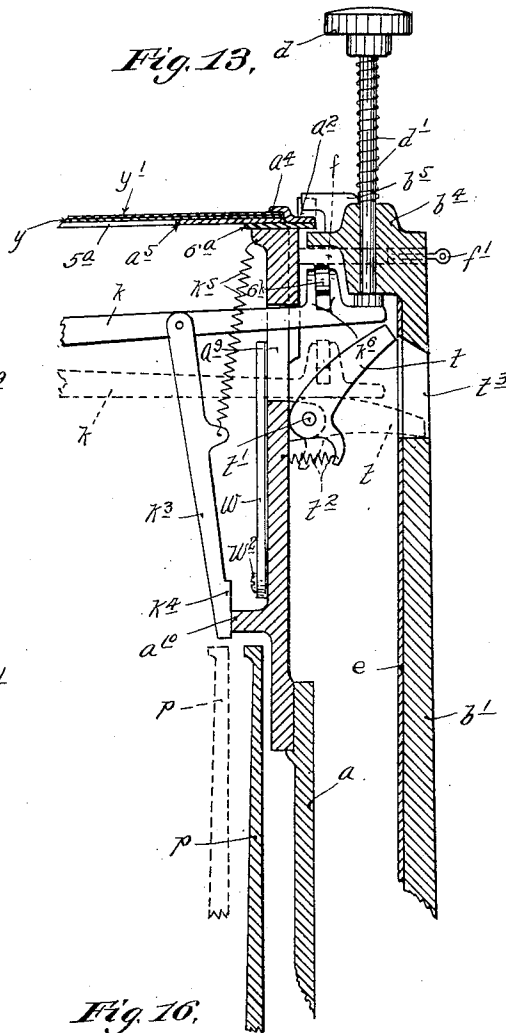


Fig. 13.

Fig. 15.

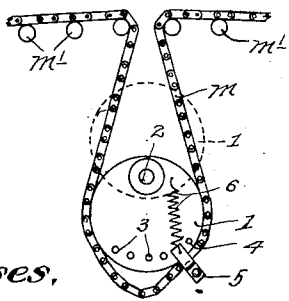
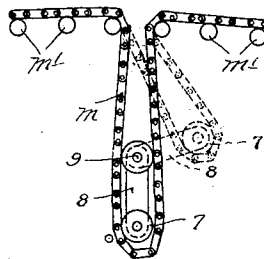


Fig. 16.



Witnesses,
Harry Kilgore
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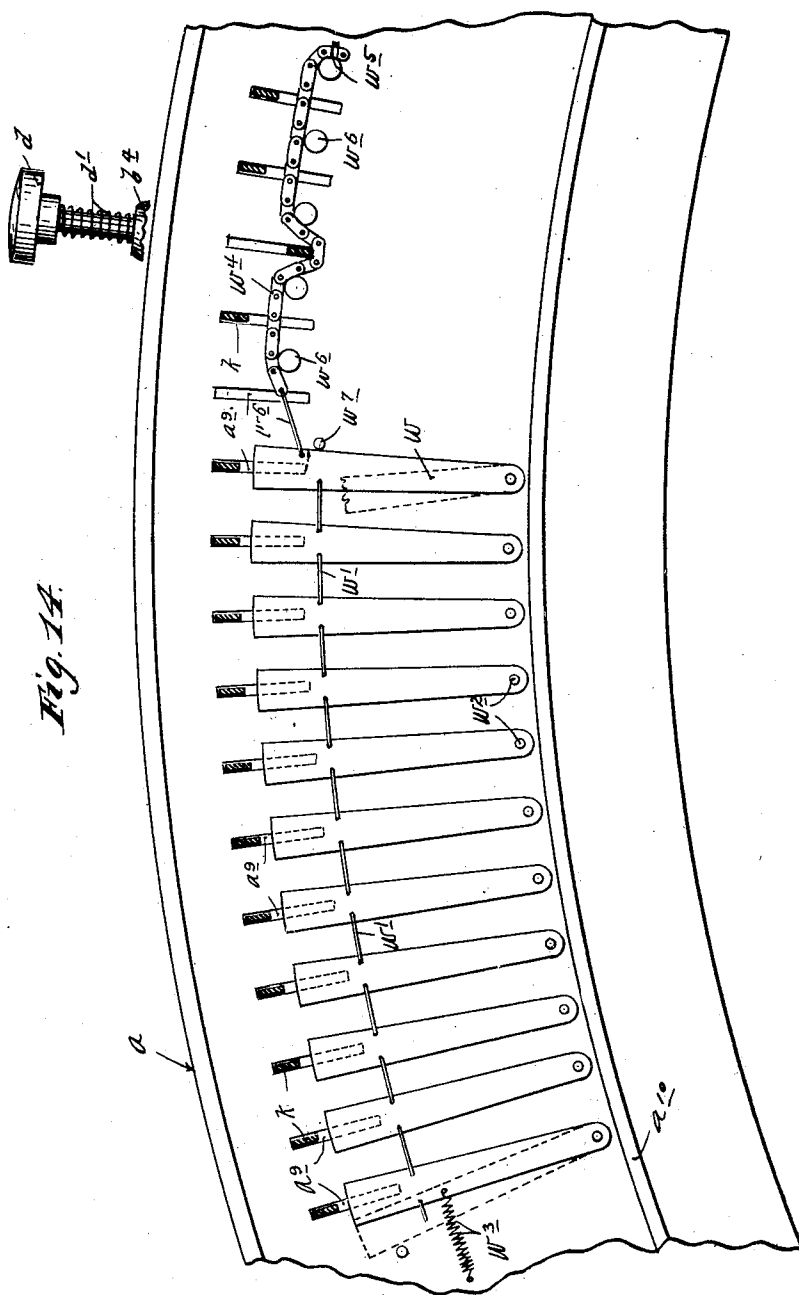
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9 Sheets—Sheet 9.



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UNITED STATES PATENT OFFICE.

SYVER LOE, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE AMERICAN VOTING MACHINE COMPANY, OF SAME PLACE.

VOTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 660,115, dated October 23, 1900.

Application filed December 18, 1899. Serial No. 740,629. (No model.)

To all whom it may concern:

Be it known that I, SYVER LOE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Voting-Machines; and I do hereby 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.

My present invention relates to voting-machines, and has for its object to improve the construction of the same by the production of a machine of small or reasonable cost the operation of which may be readily understood by the voter, which will operate rapidly and accurately, and which, furthermore, will meet all of the conditions of an election and will effectually prevent dishonest voting or tampering with the machine.

To the above ends my invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

To better prepare the reader for the specific description to be hereinafter given, the following brief forecast of the general features of the machine in its complete construction will be given: The carrier or support for the various candidate-registers and other recording devices and their actuators is in the best form of the device in the nature of a rotary drum or cylinder which is mounted to rotate on a horizontal axis, although it might be mounted to rotate on a vertical axis. The registers and their actuators are grouped and subgrouped in the proper arrangement in a continuous circular series, and there must of course be one register and actuator for each candidate represented on the ticket. There is provided also a register and actuator for each positive or negative answer to all questions submitted or voted upon, such as constitutional amendments, and, further, other registers and actuators are provided for enabling the voting for independent candidates not represented on the ticket.

Machines as hitherto constructed have embodied registers and actuators serving the above functions; but they have always been

arranged in several independent series to make up a complete voting-machine adapted to register the votes of a national, State, county, and municipal election wherein several political parties—such as the Republican, Democratic, Populist, and Prohibition parties—are represented. As one of the salient features of my present machine I assemble all of the registers and actuators in such relation to each other and their support that they may be brought in the selected order of succession to the so-called “voting point or position,” and in connection with and for operation upon the entire series of actuators I provide a single key (“key” being used in the broadest possible sense) which is adapted to operate any and all of the actuators one at a time as they are brought into the proper relation thereto or in the voting position. The key being a local key and the supporting cylinder or drum, with its registers and actuators, being movable with respect to the key enables the voter to stand in one position while casting his entire vote; but nevertheless the construction above described might be reversed within the scope of my invention, which consists, broadly, in the arrangement whereby a single key is made to operate all of the register-actuators of the complete machine.

As a means for limiting the number of votes cast for a particular office, or, in other words, the number of candidates voted for to fill a particular office, I employ a flexible band or chain which is arranged with the proper normal slack to permit the operation of the proper number of register-actuators and then to become a stop to lock the rest of the actuators in their normal positions. Such flexible bands for the above purpose have hitherto been employed, but as hitherto employed an independent section of chain has been used for each group or subgroup of register-actuators appropriated to a particular office. As an improvement on this arrangement I employ in my present invention a single continuous flexible band or chain and provide in connection therewith means for clamping the chain at various desired points between the groups of mechanism or actuators appropriated to the various candidates for a particu-

lar office. This construction has the important advantage that one adjustment of the entire chain in a manner to be hereinafter specifically described serves to set the stop or limiting means for the entire machine.

The machine further comprises mechanism for casting or registering a "total straight vote"—as, for example, to cast a straight Republican vote for the national, State, county, and municipal ticket by one action—and other mechanism by means of which the voter may register a partial straight vote—as, for example, a straight Republican vote on the national ticket and a straight Democratic vote for the municipal ticket.

The machine further comprises mechanism for registering the number of votes cast, or, in other words, for registering the number of persons who have cast their vote. Again, the machine comprises an "independent-vote" registering mechanism of novel construction. Also, this machine comprises other novel features of improvement, which will appear in the specific description of the machine.

The machine is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a plan view of the ticket or ballot strip, the same being shown in detached sections. Fig. 2 is a plan view showing a portion of the ticket and a portion of the drum or cylinder to which it is secured. Fig. 3 shows the complete machine in side elevation. Fig. 4 is a face view or end elevation of the complete machine, some parts being broken away. Fig. 5 is a detail showing the means for securing or clamping the ends of the flexible strap or stop-chain. Fig. 6 is a detail view, on an enlarged scale, with some parts broken away showing a portion of the cylinder or drum. Fig. 7 is a detail in plan with some parts sectioned and others broken away, showing a portion of the cylinder or drum and a lock-dog which coöperates therewith. Fig. 8 is a vertical section approximately on the line $x^8 x^8$ of Fig. 6. Fig. 9 is a view corresponding closely to Fig. 6, but with the drum in a slightly-different position and with parts of the drum broken away to show the independent-vote registering mechanism. Fig. 10 is a transverse vertical section taken through a portion of the drum or rotary cylinder approximately on the line $x^{10} x^{10}$ of Fig. 9. Fig. 11 is a transverse vertical section corresponding somewhat to Fig. 10, but with the drum or cylinder turned in position to show the independent-vote registering device. Figs. 12 and 13 are vertical sections corresponding to Figs. 10 and 11, but illustrating different positions of the drum or carrier, some parts being broken away. Fig. 14 is a detail showing a portion of the drum or cylinder, the same being viewed from the back or from a direction opposite that to which the machine is viewed in Fig. 4; and Figs. 15 and 16 are detail views, in front elevation, showing portions of the flexible strap

or stop-chain and devices of modified form for sustaining the loop thereof.

The ballot.—The complete printed ballot, which may be in sections or in the form of a continuous paper strip, has printed thereon in the proper order the names of all the various party candidates for the various offices and other indications of all matters to be voted upon on the several political tickets—as, for example, the national, the State, the county, and the municipal. This of course provides for a complete election; but it will be understood that any one of the political tickets if not to be voted at a given election will be omitted. The complete ballot is indicated by the character η in Fig. 1, wherein the ticket is shown as broken into sections in order to show the same on the proper scale.

The drum and supports.—The rotary supporting-drum (indicated as an entirety by the character a) is, as shown, rigidly secured on a sleeve or tubular shaft a' , the rear end of which is loosely mounted in and projects through an open bearing in the rear bracket of a supporting-frame c . The forward end of the sleeve a' is loosely mounted in the hub of a vertical supporting-arm b' , which is held against rotation and secured to the forward bracket of the frame c by means of small bolts b^2 , passed through the said bracket and through lugs b^3 of said arm. Mounted for vertical movements through the upper headed portion b^4 of the supporting-arm b' is a depressible key d , which, as shown, is in the form of a headed plunger normally held upward by a spring d' . Rigidly secured to the inner portion of the arm b' is a protecting-disk or guard-head e , which has an turned flange e' , that closely engages the peripheral portion of the adjacent head of the drum or cylinder a , so as to prevent access to the register-actuators, to be hereinafter noted. The head b^4 of the supporting-arm b' is provided with a projection or stop b^5 , which normally engages a stop-lug a^2 on the drum or cylinder a to limit the return movement of the said drum. The head b^4 also has a pointer or finger b^6 for a purpose which will hereinafter appear. The drum or cylinder a is normally yieldingly held with the stop a^2 engaging the stop b^5 , as just noted, this, as shown, being accomplished by a coiled spring b^6 and a flexible connection or cord b^7 , the former of which is attached to the fixed supporting-arm b' as a base of reaction, while the latter or other flexible connection is wound upon the hub a^3 of the forward head of the drum or cylinder a . Of course a weight or other suitable device might be employed in lieu of the spring and connection above described.

The complete ballot η when properly positioned is secured on the peripheral surface of the drum or cylinder a and nearly or quite surrounds the same, and it is thus held in position between annular retaining guides or flanges a^4 on said drum by means of a strip

of celluloid or other suitable transparent material y' , the edges of which are slipped under the said retaining-flanges a^4 .

For a purpose which will hereinafter appear the peripheral portion of the drum a between the annular guides a^4 is made up of thin narrow strips or slats a^5 , that are detachably secured and readily removable from the drum. These strips or slats a^5 are in width equal to the distance or space longitudinally of the ticket y taken up by or appropriated to any particular candidate. As shown, the said strips or slats a^5 overlap annular peripheral sections 6^a of the drum a and are held in position by the retaining-flanges a^4 .

The forward head of the drum a is provided at its peripheral portion with a series of ratchet-notches a^6 and with a single lock-notch or deep depression a^7 . For coöperation with the notches a^6 and a^7 a spring-pressed latch or lock-dog f is mounted for sliding movements in the head b^4 of the supporting-arm b' . The disposition or spacing of the notches a^6 and a^7 is such that as the cylinder or drum a is moved step by step to bring one candidate's name after the other to the voting point or position the spring-pressed latch or dog f will be successively engaged with the notches a^6 , and by the last possible step of movement of the drum (if this last step be given) said dog will be engaged with the lock-notch a^7 . The engagement of the latch or dog f with one of the notches a^6 prevents only the return movement of the drum; but the engagement of the said dog with the deep lock-notch a^7 locks the cylinder against movement in either direction until the said dog has been withdrawn from the said notch to release the cylinder. It will be understood that when the dog f is released from the lock-notch a^7 the drum or cylinder a will be restored to its normal position by the spring b^6 .

Releasing device.—The dog or latch f may be released, as above indicated, by an attendant or one of the judges of election, but not by the voter. This releasing device in the construction illustrated comprises the following details, which may nevertheless be considerably modified: The dog f is connected by a small stem f' to the upper end of a releasing-lever f^2 , which is pivoted to the supporting-arm b' at f^3 and has its lower end working through a slot b^8 in the hub b of said arm. Sliding in the rear end of the sleeve a' is a grooved head f^4 . A small rod f^5 extends through the grooved head f^4 and through a perforation in the lower end of the trip-lever. As shown, this rod f^5 is in two sections united by a transverse pin or bolt f^6 , adapted to move laterally in longitudinal slots b^9 , formed in the sleeve a' . The pin f^6 subserves a purpose hereinafter to be noted. The forward end of the rod f^5 is free to turn within the perforation in the lower end of the trip-lever f^2 . Pivoted to a small bearing f^7 on the rear bracket of the supporting-frame c is a shipper-lever f^8 , the upper end of which is pronged

and is provided with the pins f^9 , that work in the groove of the sliding rotary head f^4 . As shown, the lower end of the shipper-lever f^8 is connected by a cord or flexible connection f^{10} with the lower end of a hand-operated latch-lever f^{11} , which coöperates with a latch-segment f^{12} , being pivoted thereto at f^{13} . The latch f^{14} of the lever f^{11} is adapted to engage either of a pair of notches f^{15} in the segmental head of the bracket f^{12} , to thereby secure the said lever in either of two extreme positions, for a purpose to be hereinafter specifically stated after certain other parts controlled by the said lever have first been described. It may, however, be here further remarked that the lever f^{11} and segment f^{12} will be located at some distant point from the machine where it will be out of the control of the voter and under control of some properly-authorized person, such as the judges of election.

In some instances it may be desirable to reset the machine automatically, in which case the operating connections instead of extending to the hand-lever f^{11} might be connected to the door of a voting-booth or to some other movable part, which would be necessarily moved either as the voter enters or leaves the voting-booth.

Registers or recording-tallies.—Within the annular space formed between the rear outer portion of the drum or cylinder a and the transverse interior partition 7^a and an annular section 8^a is mounted a series of registers or tallies, each, as shown, made up of three wheels g , directly secured to supporting plates or brackets g' , the registers or tallies being located side by side and the peripheral shell of the drum a being perforated just above each wheel, as shown at a^8 , to permit the wheels to be seen from the exterior of the machine. Of course the number of wheels in each register or tally may be varied as desired. Furthermore, these tallies or registers may be of any suitable or well-known form provided with the ordinary devices for carrying the tens from the units-wheel onto the wheels representing tens, hundreds, &c. In the construction illustrated the units-wheels stand to the right as viewed in Figs. 10 and 11, and each wheel is in the form of a ratchet-wheel having the successive digits marked on the faces of the ratchet-teeth, as shown in Fig. 2, so that the total number of votes registered on any particular tally may be seen through the sight-openings a^8 .

Register-actuators.—For each register or tally there is a register-actuator, which, as shown, comprises a lever k , pivoted to a lug k' on the rear head of the drum or cylinder a and provided with a spring-held pawl k^2 , which engages the teeth of the units member of the tally or register. The levers k normally extend approximately parallel to the axis of the drum a , and they project through and work in short radial slots a^9 , formed in the outer portions of the inner or forward head of the drum a . Each register-actuating lever k is

provided inward of the radial guide-slots a^9 with a pivoted depending latch or retaining-pawl k^2 , provided at its free end with a hook or shoulder k^4 and connected by a coiled spring k^5 with the peripheral portion of the drum or cylinder a , as best shown in Figs. 10 and 11. The springs k^5 are so disposed that they normally hold the free ends of the latches or retaining-pawls k^2 against an annular lock-flange a^{10} on the adjacent head of the drum a and the levers k in their extreme upper or outermost positions. The lock-shoulder k^4 is so disposed that when the free end of a lever k is depressed or forced inward far enough to operate the corresponding tally or register it will engage under the annular lock-flange a^{10} , and thereby temporarily lock the said lever in such position. The so-called "annular lock-flange" a^{10} might of course be sectioned or made up of annularly-spaced portions, and hence it will be understood that the expression "annular lock-flange" is used in a broad sense.

There are as many of the registers or tallies and coöperating actuators as there are candidates on the complete ticket or ballot, and, furthermore, there is a register and actuator appropriated to record positive and negative answers to all questions submitted to vote and also registers and actuators appropriated to each political party represented, enabling the voting of either "complete straight ballots" or "partial straight ballots," such as straight national, State, county, and municipal votes. Otherwise, briefly stated, to vote a complete ballot, such as indicated in Fig. 1, there must be as many registers or tallies and actuators appropriated to the "complete-straight-vote" group as there are different political parties represented on the said ballot. The registers or tallies are located directly in line with the indicated candidate or particular vote to which they are appropriated, as best shown in Figs. 2 and 3. Attention is here called to the fact that in Fig. 2 the various offices and candidates are indicated as marked directly upon slats or sections a^5 , this being done simply to indicate the position which the ticket will occupy when properly positioned. When the actuators or levers k are brought to the voting point or position, the free end of the particular actuating-lever will stand directly under the inner lower end of the key d and the pointer or finger 5^b will stand in line with the name of the candidate or other form of vote which will be cast or recorded on the tally or registered by the depression of said key.

Stop-chain or limiting-band.—Just inward of their free ends the actuating-levers k are provided with vertical lugs k^6 , between the upper ends of which antifriction-rollers 6^k are mounted. The flexible limiting-band or stop-chain is indicated as an entirety by the letter m . This flexible band or chain m is passed between the lugs k^6 and under the rollers 6^k of the actuating-levers k and is also passed

over fixed studs m' , projected from the adjacent face of the forward head of the drum or cylinder a and located one between each lever k . At intervals the chain m is securely clamped to the face of the adjacent head of the drum a by means of clamps m^2 , which are adapted to be applied either as part of or as substitutes for the guide-studs m' . The clamps m^2 are placed between the subgroups of the actuating-levers k , which subgroups may be varied in extent at will, but should of course comprise a number of levers equal to the number of candidates for a particular office. At its ends the chain or flexible band is adapted to be secured to the head of the drum a by a suitable clamp m^3 . In the normal position of the levers k each section of the chain is given its maximum amount of slack, and the slack given to a particular section of chain must be just sufficient to permit the maximum permissible number of actuating-levers to be depressed in succession. For example, the section of the chain which controls or limits the operations of the four different party candidates for governor must have only sufficient slack to permit the depression of one lever, for the obvious reason that the voter is permitted to cast a vote only for one party to fill the office of governor. The chain must by the depression of the one key, be drawn taut, so that it will thereafter act as a stop to prevent the casting of another vote for governor until the machine has been reset. As another illustration let us consider that section of chain which controls the registration of votes for electors in an arrangement wherein, for instance, twenty candidates are represented with five electors to be properly voted. In this instance the chain must have sufficient slack to permit the depression in succession of five of the actuating-levers and then to act as a stop to prevent the depression of any other of the levers of that subgroup.

With the arrangement above described the subgroups may be increased and decreased in number at will to make them correspond to the arrangement of the ballot, and usually one actuating-lever k is taken out or rendered inoperative between each subgroup. From the above statements it is thought that the particular manner of adjusting the stop-chain or limiting-band for any subgroup or offices represented on the ballot will be readily understood. This summary statement may, however, be added: that any particular section of the chain appropriated to control the actuating-levers for an office wherein several candidates are represented, only one of which may be elected to a particular office, the said chain must control all of the levers of that subgroup and must permit the operation of any selected one, but no more. On the other hand, sections of the chain which control the actuating-levers appropriated to an office to which several parties will be elected, such as judges or electors, must permit by their slack the registration

in any order of the maximum possible votes for that particular office.

Loop-retainers for stop-chains.—Since in all cases the sections of the chain must have some normal slack and in most cases must have sufficient slack to form a considerable loop, I provide what I term “loop-retainers,” which while they normally leave the chain with some slack retain the loop and prevent tangling of the chain and readily yield to permit the slack or loop of a chain-section to be paid out as the actuating-levers are depressed in succession. The so-called “loop-retainers” may take several forms; but the form illustrated in the main drawings is preferred. This preferred form consists of a yoke or bracket n , which straddles the chain and is provided with a roller n' , which engages the upper surface thereof. A small stem or rod n^2 , attached to the yoke n , working through a guide n^3 and connected by a spring n^4 with the hub portion of the drum a , normally holds the bracket n against the guide n^3 , in which position the cooperating chain-section is left with considerable slack, as shown at the left in Figs. 6 and 9. As the actuating-levers are successively depressed the loop of the chain will be gradually taken up or paid out until the chain is drawn taut and becomes a stop to the rest of the levers of that particular group, at which time the roller n' and bracket n will be raised, as shown at the right in Figs. 6 and 9.

To set the stop-chain m for the arrangement of a complete ballot, such as illustrated, the ballot or ticket-strip is first properly secured to the periphery of the drum, as already indicated, and then by means of the key d the proper number of actuating-levers k for each subgroup are depressed in succession—that is, for the subgroups appropriated to offices to which but one candidate may be elected one lever is pressed downward, while with subgroups appropriated to offices to which several may be elected—such, for example, as electors, with the permissible number of five to be elected—five of the said actuating-levers are depressed, and so on throughout the ballot. The said actuating-levers when depressed will of course be temporarily locked inward by the engagement of their latches or retaining-pawls k^3 with the annular lock-flange a^{10} . Then while these levers are locked inward the chain or band m is drawn taut from its ends, and its ends are then secured by means of the clamp m^3 . Next the clamps m^2 are properly positioned between the various subgroups and are clamped upon the chain to rigidly secure it at such points. After the dogs or pawls k^3 have been released, as presently to be described, from the lock-flange a^{10} and the actuating-levers have been restored to their normal positions the machine will be ready for action and the stop-chain will be properly set to limit the number of possible votes which may be cast for any particular office.

The register-actuators are operated from the right toward the left, and the slack or loop-retainers are located at the left of each subgroup. The depression of the first one or two keys of the group or subgroup appropriated to an office to which several candidates may be elected is effected by pulling on nearly or all of the entire subsection of the chain. Hence it is important for this reason also that the chain be not normally put under tension, inasmuch as to put the chain under tension would increase the friction unnecessarily at such a time.

Trip for register-actuators.—To simultaneously release all of the dogs or retaining-pawls k^3 from the lock-flange a^{10} , I provide a tripping device, which is in the form of a head or disk p , which, however, serves several other important functions, to be hereinafter noted. This trip disk or head may of course take various forms; but, as shown, it is provided with a central hub p' , which is mounted to slide on the hollow sleeve a' and is subject to a spring p^2 , which normally holds the same in an inoperative position toward the extreme right, as shown by full lines in Figs. 10, 11, 12, and 13. The pin f^6 , heretofore noted as connecting the sections of the trip-rod f^5 and working in longitudinal slots b^9 of the sleeve a' , projects at its ends through the hub p' of the trip head or disk p , so that when the said trip-rod f^5 is drawn toward the left, as heretofore described, by means of the lever f^{11} and intermediate connections the said disk or head p will be drawn toward the left or into the position indicated by dotted lines in Figs. 12 and 13. This movement of the head or disk, it will be noted by reference to Fig. 12, serves to release all of the depressed dogs or retaining-pawls k^3 from the annular lock-flange a^{10} .

Additional functions of actuator-trip.—By reference to Fig. 13 it will be seen that the peripheral portion of the head or disk p when moved into this dotted-line position stands directly in the inward lines of movement of the said dogs, so that it serves as a lock to prevent the depression or movement of any of the actuating-levers k . This latter-noted function is important. The third function of the head or disk p is to operate the total-vote register, or, in other words, the register which records the number of persons who have voted.

Total-vote register.—In Fig. 12 the lever k' , which actuates the so-called “total-vote register,” (not shown, but which is like the other registers,) is like all of the other actuating-levers, except that it is not provided with the lugs k^6 and roller 6^k and is not subject to the action of the stop chain or band m , but is, on the contrary, attached at its free end to a light connection r , which connection r is in turn connected to one arm of a bell-crank r' , that works through a slot r^2 in the forward head of a drum a and is pivoted to lugs r^3 on said head. The other arm of the bell-crank r' is

normally held as shown by full lines in Fig. 12, in which position the actuating-lever k' of the total-register actuator is drawn downward against the tension of its spring $k^{5'}$, and it is there locked by the engagement of its dog or pawl $k^{3'}$ with a lock-flange a^{10} . When the so-called "trip head or disk" p is moved into the position indicated by dotted lines, it will not only release the dog $k^{3'}$ of the total-vote register, but will permit its spring $k^{5'}$ to raise the actuating-lever k' of that register-actuator. In this manner the total-vote register will be actuated. It will also be noted by reference to Fig. 12 that the shouldered lower end $k^{4'}$ of the pawl $k^{3'}$ is much shorter than the corresponding portion of the other pawls k^3 , so that when the parts occupy their dotted-line positions, as indicated in said Fig. 12, considerable clearance is left between the lower free end of the said pawl $k^{3'}$ and the adjacent peripheral portion of the trip head or disk p . This clearance will permit the disk p to recede in under the flange a^{10} before the free end of the said pawl $k^{3'}$ has been moved radially inward far enough to engage the said disk.

Independent-vote registers.—In each subgroup of actuators appropriated to the different offices one actuator and register is appropriated to the so-called "independent" vote, which permits the voter to vote for any person not on the ballot whom he may select. To make provision for this independent vote, the ticket or ballot is cut away or sectioned to expose the section or slot a^5 , which is marked "Independent" in Fig. 2, and this particular slot or section is cut away, as shown at 5^a in said Fig. 2, so as to permit the voter to write the name of his independent candidate on a strip of paper which is supported below the slot. This strip of paper is in the construction illustrated normally wound on a roller s' and is wound onto another roller s^2 , both of which rollers are suitably mounted in the lower portion of a bracket or frame s^3 , which is detachably secured to the inner partition-plate 7^a of the drum a by means of screws s^4 or other suitable means. The paper strip s is passed over a transversely-extended platen or shelf s^5 , which is formed on the upper portion of the bracket or frame s^3 just below the slot or opening 5^a formed in the so-called "independent" slot or section a^5 . Normally the platen s^5 is covered by the transverse portion of a U-shaped cut-off segment s^6 , that embraces the sides of the frame s^3 and is pivoted thereto at s^7 . A light spring s^8 connects a projecting lug s^9 of the segment s^6 with the frame s^3 and yieldingly holds said cut-off segment in its normal position. (Indicated by full lines in Fig. 9.) Obviously when the cut-off segment is in its normal position a pencil placed in the slot 5^a of the strip a^5 cannot reach the paper registering-strip s , and hence the name of the independent candidate cannot under these conditions be written upon the said strip. The

roller s^2 is provided at one end of its projecting shaft with a ratchet-wheel s^{10} . Extending approximately parallel to and above the roller s^2 , being pivoted to the frame s^3 at s^{11} , is a pawl-lever s^{12} , yieldingly held upward by a spring 12^s and provided at its free end with a pivoted pawl or dog s^{13} , the depending free end of which stands directly over the teeth of the ratchet-wheel s^{10} . Above the lever s^{12} the dog or pawl s^{13} is provided with a flat and transversely-extended head s^{14} , the outer portion of which normally stands directly under the free lower end of the latch or retaining-pawl k^3 of the lever k , which operates the register or tally appropriated to the independent candidate. This construction is best illustrated in Fig. 10. When the said actuating-lever k is depressed, the free end of its latch or pawl k^3 will engage the outer portion of the flat head s^{14} of the pawl s^{13} and will thereby force the pawl downward and cause the same to engage the ratchet-wheel s^{10} and move the paper strip s one step in advance. The so-called "cut-off" segment s^6 is connected by a light rod s^{15} with the free end of the pawl-lever s^{12} . The rod s^{15} is connected to one prong of the segment s^6 at a point eccentric to its pivot s^7 and is connected to the lever s^{12} by a slot-and-pin connection s^{16} s^{17} . This arrangement is such that when the lever s^{12} is depressed, as just indicated, the pin s^{16} will be first moved to the bottom of the slot s^{17} and will then draw downward on the rod s^{15} , and thereby move the cut-off segment s^6 into the position indicated by dotted lines in Fig. 9, in which position the recording-strip s is exposed to the open slot 5^a of the independent section or slot a^5 . When the segment is thus moved, a projection s^{18} on the end of a latch-lever s^{19} , pivoted to lugs s^{20} on the frame s^3 and subject to a spring s^{21} , is thrown behind the adjacent prong or side of the said segmental cut-off segment s^6 , and thereby temporarily locks the same in its opened position. (Indicated by dotted lines in Fig. 9.) The lower end of the lever s^{19} stands in position to be engaged by the peripheral portion of the so-called "trip head or disk" p when the latter is moved from its normal into its dotted-line position, (indicated in Figs. 12 and 13,) so that the said movement of the trip head or disk will release the said cut-off segment and permit the same to be returned to normal position by its spring s^8 . As the pawl or dog s^{13} approaches the limit of its downward movement its flange s^{14} is thrown into contact with a light flat spring s^{22} on the frame s^3 , which throws the pawl into the position indicated by dotted lines in Fig. 11. This action is due to the fact that the spring s^{22} engages the downwardly-curved portion of the pawl-flange s^{14} below the pivotal axis of the said pawl. As long as the lower end of the dog or retaining-pawl k^3 is held in engagement with the outer portion of the pawl-head s^{14} the dog s^{13} will be held in its operative position and against the movement just indicated as being im-

parted by the spring s^{22} . However, when the dog k^3 reaches the lowermost position and is moved laterally into engagement with a locked flange a^{19} its free lower end will be thrown clear of the flange s^{14} , so that the dog s^{13} and lever s^{12} may be restored to normal position, the former by gravity being released from the spring s^{22} and the latter by its spring 12^4 . In such instances as where there are two independent votes permissible in a particular subgroup one independent recording device such as above indicated is made to serve the purpose simply by providing the pawl-head s^{14} with an extension-plate 14^4 , as shown by dotted lines in Fig. 9, which extension-plate 14^4 underlies or cooperates with the two adjacent pawls k^3 of the levers k , which are appropriated to such two independent votes. It is to permit this independent voting for several independent candidates for a particular office that the slot-and-pin connection s^{15}, s^{17} is made between the rod s^{15} and the pawl-lever s^{12} . The first of the two levers k appropriated to the said two independent candidates being depressed will be locked down by its pawl k^3 , and the cut-off segment s^6 will be locked in its open position, as already indicated, while the lever s^{12} and its pawl s^{13} being released will be thrown back into normal positions, so that they may again be depressed and the recording-strip s moved one step in advance by the depression of the next or adjacent independent actuating-lever k and its retaining-pawl k^3 .

In some instances the paper recording-strip s may not be considered necessary, and it may be preferred simply to drop the slips of paper with the independent candidate's name into the machine. In this case the strip s and its feeding mechanism may be dispensed with and a box may be placed as a substitute therefor to receive the ballots or slips dropped through the slot opened by the so-called "cut-off" segment.

Total-straight-vote mechanism.—By the operation of the so-called "total-straight-vote" recording mechanism the voter, having first properly turned the drum a , as indicated by the pointer or finger 5^b and the markings on the ballot-strip, may by one depression of the key d cast a straight party vote for all four of the tickets represented at the election. For example, by the depression of the said key he may cast a straight Republican vote for the national, State, county, and municipal tickets, or if a less number of tickets were to be represented he could cast such a straight vote for all that were represented. This total-straight-vote recording mechanism is best illustrated in Fig. 13. The total straight votes are indicated as the head of the ballot or ticket y , and if there are four parties represented—such as Republican, Democratic, Populist, and Prohibition—there must, of course, be four actuating-levers k , lock-dogs k^3 , and cooperating registers appropriated, one to each of the said political parties, which

mechanisms are located in line with the respective markings on the said ballot-strip. Under the free outer end of each of these four "total-straight-vote" actuating-levers k is a lock or tumbler t , which is pivoted to the adjacent head of the drum a at t^1 and is normally subject to a spring t^2 , which yielding holds the free end of the tumbler or dog t upward against the under edge of the cooperating lever k . In the fixed supporting-arm b' in line with the key d is a vertical slot f , into which the free end of the aligned lock dog or tumbler t is adapted to be forced. When the key d is depressed onto one of the said four levers k , the cooperating lock dog or tumbler t will be forced into the slot f , as shown by dotted lines in Fig. 13, and as the said lever k will be locked downward by the engagement of its dog k^3 with the lock-flange a^{19} the said lock tumbler or dog t will be held or locked within the said slot f and the entire machine will be locked against rotation in either direction, so that no further vote can be cast or registered until the parts of the machine have been restored to normal positions by the movement of the trip head or disk p , as already described.

Partial-straight-vote mechanism.—At the head of each ticket—to wit, the State, county, city, and national tickets—there are four spaces marked as indicated on Fig. 1, and opposite each of these four spaces is a lever k and cooperating pawl k^3 and register g , which are appropriated to a straight vote for that ticket, the same being either Republican, Democratic, Populist, or Prohibition, according to the indication of the respective markings. When one of the said markings—such, for instance, as the section marked "Straight State ballot, Republican"—is turned into line with the pointer 5^b and the key d is depressed, a straight Republican vote will be recorded for the State ticket. This recording action is accomplished in this preferred construction of the machine by the following mechanism, which is best illustrated in Fig. 14: Pivoted in radial line, one with each actuating-key of that group of actuators which is appropriated to the State ballots, is a pivoted stop w , the entire series being connected by links w' and being pivoted at their inner ends at w^2 to the inner surface of the forward head of the drum a . A spring w^3 , connected to one of the stops w , normally holds said stops w out of line with the slots a^6 , in which the lever k moves radially of the drum. Hence in the normal positions of the stops w any of the selected keys k of the group may be operated in the manner previously described. A stop-chain or flexible band w^4 , which is secured at one end by a clamp w^5 and extends over guide studs or projections w^6 on the adjacent head of the drum a , extends under each of the said four levers k , which are appropriated to the so-called "partial-independent-vote" mechanism, which in the illustration at hand is assumed

to be the straight-State-voting mechanism. The free end of the stop-chain w is connected by a link u or otherwise to the adjacent stop w . The arrangement is such that the depression of any of the said straight-State-vote actuating-levers k will move the series of stops w so that they will stand one in the path of each of the individual actuating-levers k , and thus lock all of the said actuating-levers of the State group. This locking position of the series of stops w is indicated by full lines in Fig. 14, and in this position the right-hand stop w is brought against a stop pin or projection u' on the drum-head, and by this stop the chain w is held so that it acts as a stop to the other three of the independent-vote-register actuating-levers. It will also be noted by reference to Fig. 14 that one of the levers k is omitted or rendered inoperative between the so-called "independent" and "individual" actuating-levers of the State group.

The drum or cylinder a is preferably provided with a plurality of projecting hand-pieces a'' , by means of which the drum may be moved from one desired voting position to another. The actuating-levers k of the so-called "partial-independent-vote" mechanism are not subject to the action of the stop-chain w .

Summary and operation.—The specific actions of the various devices have already been given, and the general operation of the machine as an entirety will now be summed up briefly.

The voter having been given access to the machine, which may be located in a booth or any other suitable place, by taking hold of the handpiece a'' of the drum or cylinder a may move the said drum step by step from its normal position (indicated in Fig. 4) in the direction indicated by the arrow marked on said figure, so as to bring the various candidates indicated on the ballot-strip into line with the pointer or finger $5'$, and by the depressions of the key d may register the votes for that candidate, or his answer to various proposed questions or other things submitted to vote. Each and every actuating-key k which is thus depressed will, as has already been stated, be temporarily locked down by the engagement of their pawls or dogs k^3 with the annular retaining or lock flange a'' . Also it will be remembered that the registration of the proper number of votes is properly limited by the so-called "lock-chain" or flexible limiting-band m , which cooperates with the ends of the actuating-levers k . When all of the votes to which the voter is entitled have been registered by the machine and the drum a has been turned to its extreme position away from normal, the spring lock-dog f will, as has already been stated, enter the deep notch a' in the drum a , and thereby lock the drum against movement in either direction, so that the machine cannot be further manipulated by the voter. After the voter has left the machine

the judge or attendant by means of the lever f'' and connections therefrom to the so-called "trip head or disk" p draws the said disk or head into its dotted-line position, as indicated in Figs. 12 and 13, and by this action simultaneously releases all of the lock pawls or dogs k^3 from the annular lock-flange a'' , and thereby permits the springs k^2 to restore all of the actuating-levers k to their normal positions. This same movement of the head or disk p and other connections, heretofore noted, it will be remembered, simultaneously with the releasing of the pawls k^3 withdraws the lock-dog f from the notch a' and permits the spring b^6 to rotate the drum or cylinder a backward to its normal position. Again, it will also be remembered that the above outward movement of the trip head or disk p , acting on the bell-crank r' , as shown in Fig. 12, serves to permit one of the movements of that particular actuating-lever k which operates the so-called "total-vote register." It will be here also understood that if in the operation of the machine by the voter any one of the actuating-levers k appropriated to the so-called "partial-straight-vote" mechanism, such as the mechanism for registering a straight State vote, for instance, has been depressed and locked down by its dog k^3 , it will be released by the above movement of the trip head or disk p , which releases the other members of the depressed latch-dogs k^3 . When one of these latter-noted levers (best indicated in Fig. 14) has been released, the spring u^2 will move the stops w back into normal or operative positions, as partially indicated by dotted lines in Fig. 14. Attention is also here more particularly called to the fact that if a total straight vote has been registered, in which case the lock dog or tumbler t will be held in the slot B of the arm or support b' by the engagement of the dog k^3 of the depressed cooperating lever k , the said lock-dog k^3 will, by the movement of the trip head or disk p , as above described, be released, and thereby permit the said lever k and the said lock tumbler or dog t to be restored to normal positions by their respective springs.

In Figs. 15 and 16 modified forms of the so-called "loop-retainers" for the flexible stop band or chain are illustrated. In Fig. 15 the numeral 1 indicates an eccentric pivoted at 2 and provided with several perforations 3, in any one of which a stop-pin 4 is adapted to be inserted. The inserted stop-pin will normally be held against a fixed stop 5 by means of a spring 6. When the slack of the chain is taken up, the spring 6 will yield to permit the eccentric to assume the position indicated by dotted lines in Fig. 15, under which movement the said spring will wrap around the hub of the eccentric. In the construction illustrated in Fig. 16 the loop is maintained by a roller 7 on the free end of the arm 8, which arm is pivoted at 9 and is adapted to swing into the position in-

indicated by dotted lines in said Fig. 16. With this arrangement also the chain normally has slack.

The purpose of the slats of the peripheral drum-sections a^5 may be briefly stated as follows: In setting the machine for different elections the number of candidates in a particular subgroup or the number of offices in a particular group or on a particular ticket will vary. Hence under the different adjustments the so-called "independent-vote" registering mechanisms must be located at various different points not possible to determine in the construction of the machine and varying from time to time and for different elections or for different localities. The sections a^5 are capable of all sorts of adjustments and rearrangements, so that the particular slats a^5 , having the slots 5^a , may be located in the proper relation to the recording-strip s and platen s^5 of the independent-vote register.

In practice a band or covering (not shown) would advisably be employed to cover the sight-openings a^8 to the various registers while the machine is in use at an election, so as to prevent the voters from keeping track of the number of votes recorded for any particular candidate. Also in practice a shield would advisably be employed to cover the so-called "trip-lever" f^2 .

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a voting-machine, the combination with a single local key and a rotary support, of a circular series of registers and register-actuators carried by said rotary support, which registers and actuators are grouped to correspond to a plurality of political tickets, such as the State ticket, county ticket, &c., each group including the registers and actuators appropriated to the candidates of the several political parties represented, and are subgrouped to correspond to the several different party candidates for the same offices, substantially as described.

2. In a voting-machine, the combination with a plurality of registers and register-actuators arranged in a single circular series and grouped to correspond to a plurality of political tickets, such as the State ticket, the county ticket, &c., each group including registers and actuators appropriated to the several political parties represented, and subgrouped to correspond to the several different party candidates for the same offices, a single key operative in succession on the said series of actuators, in the selected order, and a flexible limiting-band extended circumferentially of said circular series of actuators and secured between the subgroups for coöperation with said actuators to limit the number of actuators possible to be operated in the various subgroups, substantially as described.

3. The combination with a rotary drum or cylindrical support, of a plurality of registers, a corresponding plurality of register-actua-

tors projecting through one head or end of the said drum or support, a relatively-fixed shield disk or head inclosing all of the said projecting portions of the register-actuators, and a local key at the voting-point projecting within said shield or head for operation in succession on said register-actuators, as they are brought to the voting-point, substantially as described.

4. The combination with a rotary drum or cylindrical support having an annular lock flange or shoulder, of a plurality of registers mounted in an annular series within said drum, a plurality of register-actuators with latches for locking them when operated, to said lock-flange, a protecting head or disk inclosing the key-engaging portions of said actuator, and a local key working through said protecting head or disk for operation upon said actuators, one at a time, as they are brought to the voting-point, substantially as described.

5. The combination with the rotary drum or cylindrical support a having the annular lock-flange a^{10} , of the plurality of registers, mounted in an annular series on said drum a , the plurality of actuating-levers k having pawls k^3 and k^4 coöperating, respectively, with said lock-flange 10 and said registers, the springs k^5 applied to said pawls k^3 , the protecting head or disk inclosing the ends of said levers k , and the single local key d operative on the levers k , as they are brought to the voting position, substantially as described.

6. In a voting-machine, the combination with a rotary drum, of a series of registers mounted in a circular series thereon, a corresponding series of register-actuating levers projecting through one end or head of said drum or support, a disk or head inclosing the projecting portions of said actuating-levers, a pawl or dog, mounted in said head or disk and operating on said drum or support to permit the step-by-step movement thereof, and a local key working through said head or disk for action on the said register-actuators in succession as they are brought to the voting-point, substantially as described.

7. In a voting-machine, the combination with a rotary drum or support and a local key, of a series of registers and register-actuators, carried by said drum, in circular arrangement, latches for holding said actuators locked after operation, a pawl or dog operating on said drum to prevent return movements thereof, a yielding device putting said drum under strain to return to normal position, and trip mechanism for releasing said actuator-latches and said ratchet pawl or dog, substantially as described.

8. In a voting-machine, the combination with a rotary drum or support, of a series of registers and register-actuators, said actuators having a series of latches, of a relatively-fixed head or disk cutting off access to said register-actuators, a single local key working through said head for action in succession

upon said register-actuators, a device with which said actuator-latches are engageable to hold said actuators in their operated positions, and means for simultaneously, or by a single action, releasing all of said actuators, substantially as described.

9. In a voting-machine, the combination with a local key and a rotary drum or support, of a series of registers and register-actuators mounted on said drum in a circular series, an annular lock flange or shoulder on said drum or support, latches on said register-actuators engageable with said annular lock-flange to hold said actuators in their operated positions, and a circular head or trip disk movable to release the engaged latches from said lock-flange, substantially as described.

10. In a voting-machine, the combination with several groups of registers and register-actuators, of a single flexible limiting-band or stop-chain coöperating with said actuators of the several groups, and securing devices applicable to the chain or band at any of several different points, whereby the chain may first be properly adjusted and then secured at the various points between the groups, substantially as described.

11. In a voting-machine, the combination with a drum or cylindrical support and a single operating-key, of a series of registers and register-actuators in circular arrangement on said drum, a flexible limiting-band or stop-chain coöperating with the entire series of actuators, and clamps or fastenings for securing the ends and intermediate portions of the said band or chain, substantially as described.

12. In a voting-machine, the combination with a local key and a rotary drum or support, of a circularly-arranged series of registers and register-actuating levers on said drum, latches for locking down the actuator, when operated, a trip for releasing said latches, a flexible limiting-band or stop-chain running over suitable guides on said drum, and coöperating with said actuating-levers, and means for securing said stop band or chain at its ends and intermediate portions, substantially as described.

13. In a voting-machine, the combination with a series of registers and register-actuators, of a flexible limiting-band or stop-chain working over suitable guides and secured at intervals as a means for limiting the number of actuators possible to operate in a particular group or subgroup, and a yielding loop-retainer subject to a stop that normally holds the said retainer in position to maintain the loop of said chain but which prevents said retainer from normally putting said chain under tension, whereby said chain is normally loose but is put under tension by the said loop-retainers as it is drawn taut, substantially as described.

14. In a voting-machine, the combination with a rotary drum or support, of a series of

registers and register-actuators carried thereby and appropriated individually to various candidates represented on the ballot, and a straight-vote recording mechanism comprising a register, a register-actuator and a lock for locking said drum or carrier against rotation, which lock is actuated by or with the actuator for the straight-vote-recorder, substantially as described.

15. In a voting-machine, the combination with a rotary drum or support, of a series of registers and register-actuators mounted thereon and appropriated individually to the candidates, of a protecting head or disk inclosing said actuators, a local key working through said head or disk for action in succession upon said actuators, and a straight-vote recording device comprising a register, a register-actuator and a lock, which lock is engageable with said head when actuated by the said straight-vote-register actuator, to lock the entire drum or carrier against rotation, substantially as described.

16. In a voting-machine, the combination with mechanism for recording individually votes for candidates represented on the ballot, of a "straight-vote" recording mechanism, comprising a register, the register-actuating lever *k*, having the spring-held latch *k*³, and the lock dog or tumbler *l*, subject to the actuating-lever *k* and adapted to be thereby forced into engagement with a coöperating detent, to lock the machine, substantially as described.

17. In a voting-machine, the combination with a group of registers and actuators and means for limiting the number of actuators possible to be operated, of an independent-vote registering mechanism comprising two or more of the actuators of said group, and a single or common independent-vote limiting device operated by the said two or more actuators appropriated to the independent-vote registering mechanism, substantially as described.

18. In a voting-machine, the combination with a group of registers and actuators and means for limiting the number of actuators possible to be operated, of an independent-vote registering mechanism, comprising two or more of the actuators of said group, a recording-strip, a cut-off movable to afford access to said recording-strip, a latch for holding said cut-off in its opened position, a trip for said latch, a pawl-and-ratchet feed device for said recording-strip, which device is subject to the action of the two independent actuators, and is adapted to be given its second movement while said cut-off is held open, substantially as described.

19. In a voting-machine, the combination with a drum or cylinder having detachable or adjustable peripheral sections, of a series of registers and register-actuators spaced to correspond to the detachable peripheral sections of the drum, and detachable and ad-

justable "independent-vote recording devices" adapted to be interposed in the said series of registers, substantially as described.

20. In a voting-machine, the combination
5 with a plurality of registers and register-actuators in circular arrangement, and a single actuating-key operating in the selected order of succession, on said actuators, of latches for securing said actuators in operative positions, a releasing device for said latches,
10 and a total-vote register connected for one operation for each complete releasing action of said releasing device, substantially as described.

15 21. In a voting-machine, the combination with a rotary drum or carrier and a single local key, of a plurality of registers and register-actuators mounted in circular arrangement on said rotary support, latches for securing said actuators in their operated positions, a common trip device for releasing all
20 of said latches, and a total-vote recording

device comprising a register, a spring-held lever and a part subject to the action of the releasing device, having connections to the
25 said total-vote recorder, and operating substantially as described.

22. In a voting-machine, the combination with a drum or cylindrical support, of a series of registers and register-actuating levers
30 in circular arrangement on said drum, a series of latches cooperating with an annular flange to hold said levers in operated positions, a reciprocating trip or releasing head for said latches, and a total-vote recorder
35 having a part subject to the action of said trip or releasing head, substantially as described.

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

SYVER LOE.

Witnesses:

JAS. F. WILLIAMSON,
MABEL M. MCGRORY.