G. STACY & G. A. JULIUS.

VOTING MACHINE.

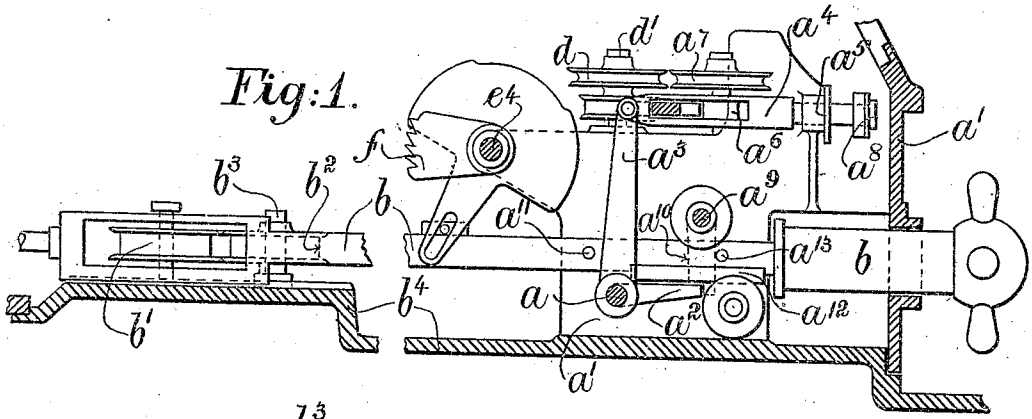
APPLICATION FILED AUG. 21, 1907.

939,929.

Patented Nov. 9, 1909.

3 SHEETS—SHEET 1.

Fig: 1.



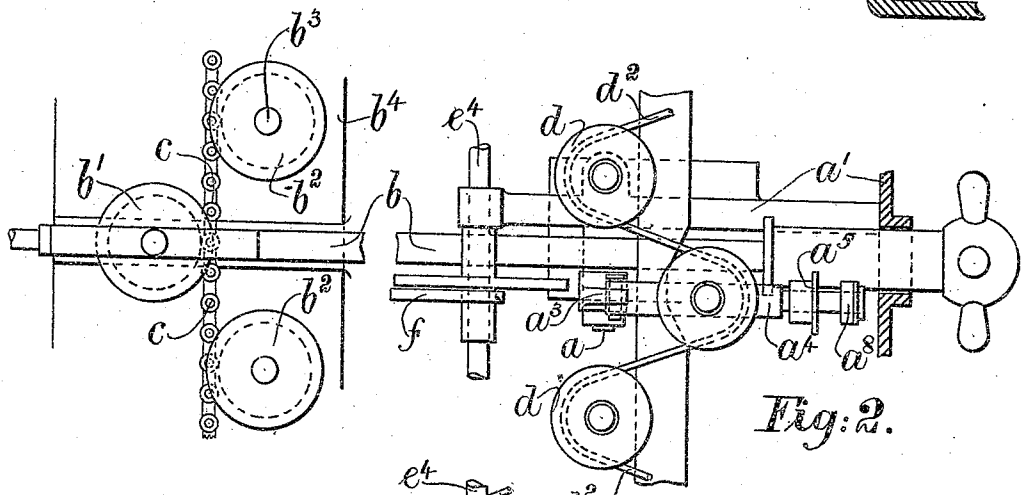


Fig: 2.

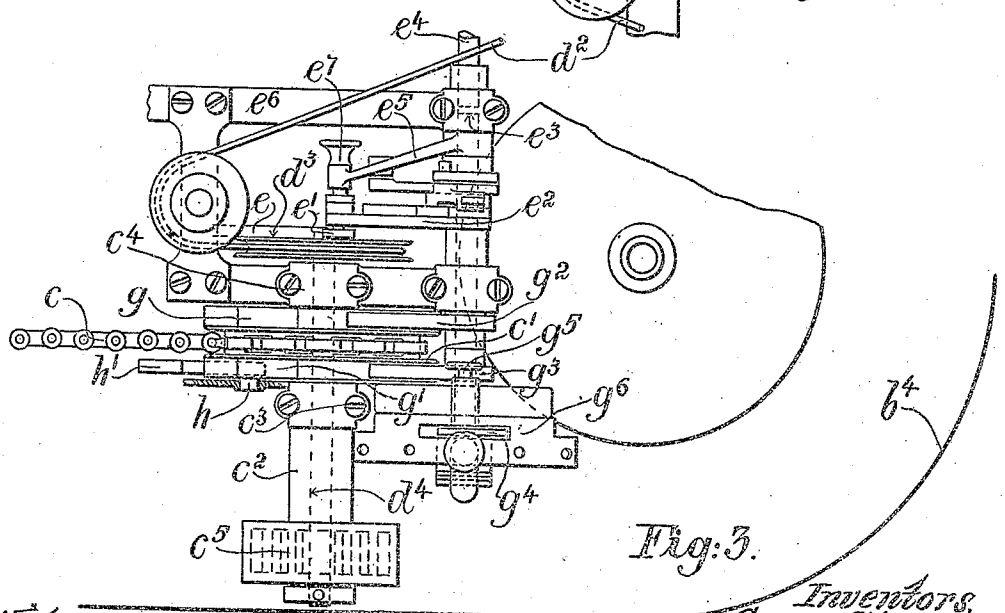


Fig: 3.

Witnesses.

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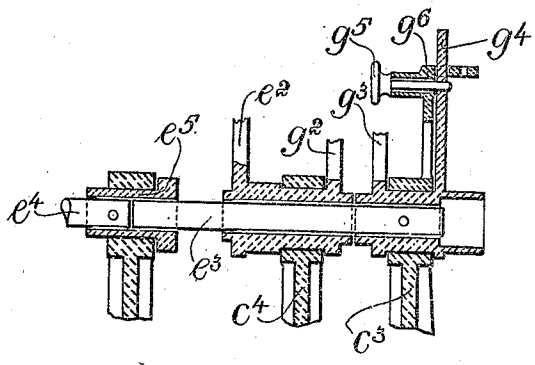

Fig: 4.

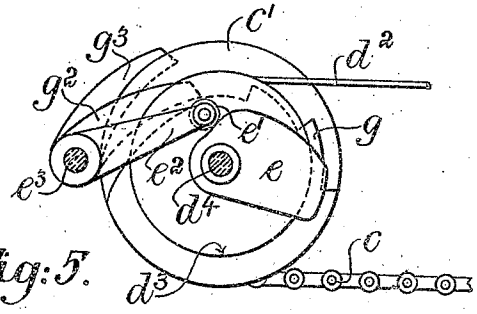

Fig: 5.

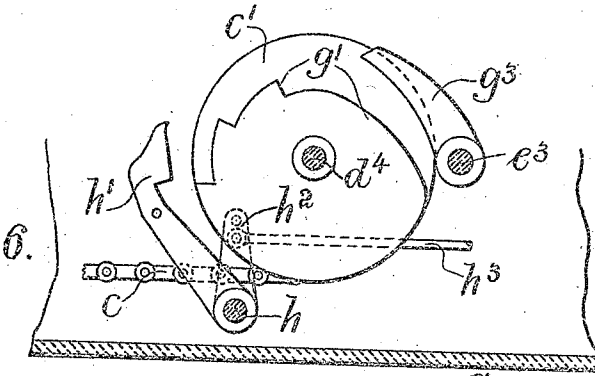

Fig: 6.

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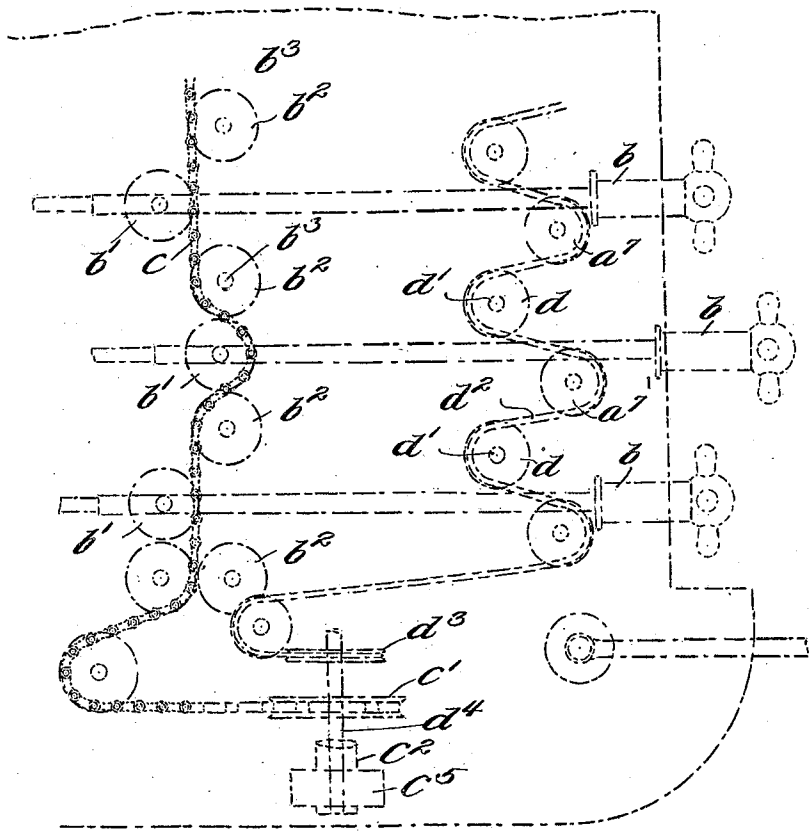
3 SHEETS—SHEET 3.

Fig. 7.



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UNITED STATES PATENT OFFICE

GEORGE STACY AND GEORGE ALFRED JULIUS, OF PERTH, WESTERN AUSTRALIA, AUSTRALIA.

VOTING-MACHINE.

939,929. Specification of Letters Patent. Patented Nov. 9, 1909.

Original application filed December 26, 1906, Serial No. 349,478. Divided and this application filed August 21, 1907. Serial No. 389,467.

To all whom it may concern:

Be it known that we, GEORGE STACY and GEORGE ALFRED JULIUS, both subjects of the King of Great Britain, residing at Perth, in the State of Western Australia and Commonwealth of Australia, have invented certain new and useful Improvements in Improved Voting-Machines, of which the following is a specification.

This invention relates to new and useful improvements in locking and controlling devices for the operating bars of voting machines.

One object of the invention is the provision of novel means for locking an operating bar in the "out" position, that is, in the position into which said bar is pulled in registering a vote.

A further object of the invention is the provision of novel means whereby the number of bars to be manipulated by a single voter and consequently the number of votes to be registered can be regulated by the proper officer.

A further object of the invention is the provision of novel means whereby the operating bars must be manipulated one at a time and whereby the simultaneous manipulation of two or more of said bars, which would vitiate the results recorded in the preferential system of voting, is positively prevented.

This present locking and controlling device is designed particularly for use in connection with the voting machine structure forming the subject matter of our co-pending application for United States Letters Patent, Serial No. 349,478, filed December 26, 1906, of which this application is a division.

The use, construction and operation of our improved key arrester mechanism will now be explained in conjunction with the attached drawings and in which the machine as a whole is shown unlocked, that is ready to be operated.

In said drawings:—Figures 1 and 2 are respectively elevation and plan of the individual pull bar mechanism. Fig. 3 is a plan view of the control locking gear. Fig. 4 is a sectional view of the control gear spindle and as shown in Fig. 3. Fig. 5 is an elevation of the control gear showing the locking cams and chain wheels. Fig. 6 is a similar view of said gear but looking from the opposite side and also showing the locking arm. Fig. 7 is a view showing diagrammatically the arrangement of the parts of the present invention in an organized machine, the purpose of this view being to show the relationships between the mechanisms entering into the present organization.

Referring to these drawings the pin a which is fixed in each bar frame a^1 serves as the pivot for a "bar stop" a^2 and operating lever a^3. The lever a^3, at its upper end has suitable connection with one end of a slide frame a^4 the other end of which frame is supported by a fixed guide a^5 which is a portion of the main bar frame a^1.

As shown in Fig. 1 each slide frame a^4 carries a roller a^6 and wheel a^7 both of which are separately free to rotate about a vertical axis, and the movement of the slide frame is controlled by a stop a^8 which comes against guide a^5.

As hereinafter described each slide frame a^4 is urged to move horizontally so as to bring the stop a^8 into contact with the supporting guide a^5. This cannot happen until the lever a^3 and the stop a^2 which are rigidly connected together are allowed to turn about the pin a.

Upon the fixed pin a^9 is carried a "locking lever" a^{10} which when in the position shown rests on top of one corner of the bar lock a^2 and prevents its rising.

When a pull bar b is pulled out, a pin a^{11} projecting from it comes against the edge of the lock lever a^{10} causing it to rotate clear of the point of the lever a^2. By this time the inner end of the fixed steel strip a^{12} carried by and projecting from the underside of the pull bar b is beyond the outer end of the lock a^2. Therefore, as the lock lever a^{10} is moved off the lock a^2 the "slide frame" a^4 moves over until the stop a^8 and the guide a^5 come into contact thus rotating the lever

a^3 and consequently the lock a^2 about the pin a. The point of the lock a^2 is thus raised behind the inner end of the lock strip a^{12} thereby preventing the return of the pull bar b when the handle is released. The bar b is now held "out" until such time as the slide frame a^4 is pulled back into the first position as shown in Fig. 1, thereby depressing the outer end of the lock a^2 which frees it from strip a^{12} and allows the pull bar b to return to its original "in" position.

The function of the "locking lever" a^{10} is twofold. (1) It does not release the end of the lock a^2 until the strip a^{12} is well past the lock a^2 outward, thus insuring the full upward travel of the point of the lock a^2 when so released and thereby rendering the "lock" thoroughly sound and effective. (2) In the position shown the top surface of the lock a^2 is held slightly below the lower surface of the strip a^{12} hence as the bar is pulled out there is no "wear" between the two surfaces.

The pin a^{13} carried by the bar b pushes the locking lever a^{10} back over the lock a^2 as the pull bar b returns to the "in" position; the parts a^2, a^{12} and a^{10} are constructed of hardened steel to withstand wear. As best shown in Fig. 2 each pull bar b carries a wheel b^1 free to rotate on a vertical axis. Between each pull bar is a similar wheel b^2 free to rotate upon a pin b^3 which is rigidly held vertically in the main base frame b^4. A steel link chain c is threaded between the wheels b^1 and b^2 as shown in Fig. 2 which shows the pull bar in the "in" position. One end of the chain c is connected in suitable manner to the main frame b^4 (such connection not being shown) while the other end is carried around and is attached to a chain wheel c^1 (see Fig. 3) which is itself fixed on the spindle c^2 carried in bearings in the frames c^3 and c^4. A rotative spring c^5 is so connected to this chain wheel c^1 through its spindle c^2 as to maintain a "tension" on the chain c thus always tending to keep it "taut".

When a bar is pulled "out," the corresponding wheel b^1 is moved forward between two guide wheels b^2, thereby forming a loop in the chain c and drawing up the free end of the chain. This rotates the main chain wheel c^1 against the tension of the spring c^5. Each bar as it is pulled out rotates the wheel c^1 through a definite distance, but when the pull bars are released by the withdrawal of the lock a^2 the tension on the chain c causes it to be straightened out, thereby returning such pull bars as may have been pulled "out" to the "in" position.

As previously described, each slide frame a^4 carries a grooved wheel a^7 and between each slide frame is a grooved wheel d which is carried by a pin d^1 fixed vertically in the bar frame a^1. A very flexible light steel wire chain d^2 is wound around the grooved wheels d and a^7 alternately as shown. One end of this wire d^2 is fixed rigidly to the main frame of the machine, and the other end is attached to a grooved wheel d^3 which is fixed upon a spindle d^4. This spindle d^4 is carried by and is free to rotate in and concentrically with the spindle c^2 of the chain wheel.

One end of the rotative spring c^5 is attached to the spindle c^2 thereby maintaining a tension upon the chain c as previously described; the other end of the spring c^5 is attached to the spindle d^4 in such a manner that a constant tension is maintained upon the steel wire d^2. Therefore, when any slide frame a^4 is released by the pulling out of a pull bar b the wire d^2 pulls the corresponding wheel a^7, and hence the frame a^4 attached thereto toward the fixed wheels d and thus through the connections described "locks" the "pull bar" in the "out" position. As each frame a^4 is freed, the wheel d^3 rotates through a fixed angle, as it winds up the wire d^2 to the "allowed" extent. Attached to and rotating with the wheel d^3 is a snail cam e upon which the roller e^1 carried by the arm e^2 bears. This construction is shown in Figs. 3 and 5. This snail cam e is so proportioned that equal angular movements of the wheel d^3 produce equal angular movements of the arm e^2 about the spindle e^3 which is coaxial with the spindle e^4 but not directly connected thereto.

Whenever a "pull bar" is pulled out, the corresponding slide frame a^4 in locking the bar "out", allows the spring c^5 to turn the wheel d^3 through a certain "angle" the wire or chain d^2 being let out to a certain extent, and wound upon the wheel d^3. The pulling of each and every pull bar similarly allows a definite angular movement of the wheel d^3 which turns through an equal angle with each bar pulled out. Therefore, as each bar is pulled, the arm e^2 is also turned through a fixed angle by means of the "snail cam" e and roller e^1 bearing thereon.

As shown in Fig. 3 an arm e^5 which is carried in a bearing in the frame e^6 coaxially with the spindle e^4 and rigidly connected thereto is caused to move with the arm e^2 by means of the thumb pin e^7. Therefore, when connected in the manner shown, the spindle e^4 is turned through a certain angle whenever a pull bar is drawn out and then locked. This angle termed herein the "unit" angle, is so arranged as to be exactly equal to the angular pitch of the teeth on the ratchet toothed segment f carried on spindle e^4. On each side of the chain wheel c^1, and rigidly attached thereto, is a stepped cam g and g^1 respectively, which rotate with the chain wheel c^1 whenever a "pull bar" is drawn

out. Two steel pawls g^2 and g^3 are so arranged as to engage with the steps on the cam g and g^1 respectively.

The pawl g^3 is attached to the spindle e^3 and both are controlled by the arm g^4, which can be locked in any one of four or more positions by means of the spring pin g^5 in the fixed quadrant g^6 on the frame c^3. (See Figs. 3 and 4.) When the arm g^4 is fixed in the first position the pawl g^3 is so situated as to engage with the first step of the cam g^1. This will only allow the chain wheel c^1 to revolve through the angle required when one pull bar is drawn out. In the second position of the arm g^4 the pawl g^3 will engage with the second step of the cam g^1 thus allowing the chain wheel c^1 to be rotated to such an extent as will permit two pull bars being drawn "out". By initially setting the arm g^4 and, therefore, the pawl g^3 in the first, second, third, or other position, the maximum number of pull bars to be operated can be absolutely controlled, the first position allowing one vote to be recorded the "second" two, the "third" three, and so on. The pawl g^2 is rigidly attached to the roller arm e^2 and revolves with it freely about the spindle e^3 and is further guided and supported by a bearing in the frame c^4. The pawl g^2 is so "set" relatively to the roller e^1 on the arm e^2 that it will engage with the first step on the cam g when the wheel d^3 and roller and arm e^2 are in the "initial" position, that is prior to any pull bar being drawn "out". In this position, the pawl g^2 will only allow "one" movement of the chain wheel c and, therefore, will only allow one bar to be pulled out. But immediately a bar is pulled out, the arm e^2 is turned through a "unit" angle by the rotation of the wheel d^3 as previously described, and this rotation is just sufficient to shift the pawl g^2 so that it will now engage with the second step of the cam g thereby allowing a second bar to be "pulled" provided that g^3 is set to allow more than one vote. Similarly, on the complete pulling of a second bar, the pawl g^2 automatically lifts and allows a third vote.

The function of the pawl g^2 is to prevent the pulling of two handles simultaneously which, would vitiate the results recorded in the preferential system of voting, the arrangement being such that the pulling of the first handle frees the machine for the pulling of another, which when carried out frees it for another, and so on; always provided that the fixed pawl g^3 is set to allow the additional votes.

As shown in Fig. 6 the spindle h, carried in bearings and free to rotate in the frames c^3 and e^6 carries an arm h^1 with an end so formed that it can engage with the last step of the stepped cam g^1 when the pull bars are all "in", and when so engaged, thereby prevents the pulling of any bar until a rotation of the shaft h moves the arm h^1 out of engagement with g^1.

From the preceding it is seen that two pawls g^2 and g^3 with their corresponding stepped cams g and g^1 and the arm h^1 entirely control every pull bar, no matter how many there may be, no other individual lock of any kind being required to prevent the pulling of any pull bar. This insures great simplicity, easy maintenance, and efficient operation. This arm h^1 is made to engage with cam g^1 by spindle h being rotated by arm h^2 which is connected to the cam of the voter's entry gate by means of the rod h^3.

What we claim as our invention and desire to secure by Letters Patent is:

1. In a voting machine, a plurality of operating bars, means to lock each bar in its operative position, an element operated by each bar as it is moved to operative position, to move through a "unit" distance, means to engage said element at the completion of its movement through the "unit" distance and to prevent further movement thereof and means operable subsequent to the operative movement of a bar to move said engaging means to a position permitting of a further movement of the element through a "unit" distance upon the next operative movement of another bar.

2. In a voting machine, a plurality of operating bars, means to lock each bar in its operative position, an element operated by each bar as it is moved to operative position, to move through a "unit" distance, means to engage said element at the completion of its movement through the "unit" distance and to prevent further movement thereof and means operable automatically by a locking means subsequent to the operative movement of the bar controlled by said locking means to move said engaging means to a position permitting of a further movement of the element through a "unit" distance upon the next operative movement of another bar.

3. In voting machines, in combination, an axially movable operating bar formed with a projection, a pivoted locking member movable to operatively engage said projection at the completion of the operative movement of the bar, a pivoted stop normally engaging the locking member to hold the same inactive, a pin provided on the bar to engage said stop and to move the same out of engagement with said locking member, and means for moving said locking member into operative position upon the disengagement of said stop therefrom.

4. In voting machines, in combination, independently movable operating bars, and regulatable means for permitting of the opera-

tion of a selected number of said bars and for preventing the movement of other bars beyond the determined selected number, and comprising a movable stepped cam, operative connections between said cam and each bar, for causing operative movement of the former upon operative movement of the latter, a stop pawl having movement to engage any selected step of said cam, and means for locking said stop pawl at selected positions with relation to said stepped cam.

5. In voting machines, in combination, independently movable operating bars and means for permitting of the operation of but one bar at a time and for preventing the operation of two or more of said bars simultaneously, said means comprising a movable stepped cam, a snail cam movable through an angle corresponding to the angle of movement of the stepped cam, a pawl arranged to engage the successive steps of the stepped cam and provided with an arm engaging the snail cam, operative connections between the stepped cam and each operating bar for causing operative movement of the former upon operative movement of the latter and means for causing operative movement of the snail cam at the completion of the operative movement of each operating bar.

6. In voting machines, in combination, independently movable operating bars and means for permitting of the operation of but one bar at a time and for preventing the operation of two or more of said bars simultaneously, said means comprising a movable stepped cam, a snail cam movable through an angle corresponding to the angle of movement of the stepped cam, a pawl arranged to engage the successive steps of the stepped cam and provided with an arm engaging the snail cam, operative connections between the stepped cam and each operating bar for causing operative movement of the former upon operative movement of the latter and means for causing operative movement of the snail cam at the completion of the operative movement of each operating bar and comprising an operating lever for each bar, detent means for normally holding each operating lever inactive, means associated with each bar and having operation upon operative movement of said bar for disengaging said detent means, operative connections between said snail cam and each operating lever, and means for causing operation of said connections to move said snail cam upon the release of each operating lever by its detent means.

7. In voting machines, in combination, independently movable operating bars, a stepped cam, a pawl to engage the successive steps of said cam and to prevent further movement thereof, means for establishing an engagement between said pawl and said cam upon operation of one of said bars, and means having operation after the completion of the operative movement of an operating bar to cause a change in the relative positions of said pawl and said cam, whereby said pawl will engage the step of said cam next in order of succession upon next successive operative movement of another operating bar.

8. In voting machines, in combination, independently movable operating bars, a stepped cam, a pawl to engage the successive steps of said cam and to prevent further movement thereof, means having operation upon operative movement of any one operating bar for moving said cam until engaged by said pawl, and means having operation after the completion of the operative movement of an operating bar to shift said pawl to a position to engage the step of said cam next in order of succession upon further operative movement of said cam.

9. In voting machines, in combination, independently movable operating bars, a stepped car, a snail cam, spring means for causing movement of said snail cam, operative connections between said stepped cam and each operating bar for causing operative movement of the former upon operative movement of the latter, a connection between said stepped cam and said spring means whereby operative movement of the former stores power in the latter, means holding said snail cam normally against movement and having operation to permit of movement of the snail cam upon the completion of the operative movement of an operating bar, a movable pawl to engage the successive steps of said stepped cam, and means controlled by said snail cam and associated with said pawl to effect movement thereof.

10. In voting machines, in combination, independently movable operating bars, a wheel, connections between said wheel and each operating bar for causing operative movement of the former upon operative movement of the latter, a stepped cam located on each side of said wheel and movable therewith, a pawl for engagement with one cam, means to hold said pawl in a selected adjustable position to permit of a determinate degree of movement of the cam controlled thereby, a second pawl arranged to engage the successive steps of the other cam, and means for shifting said second pawl and having operation at the completion of the operative movement of an operating bar.

11. In a voting machine, the combination with a plurality of pull bars and locking means for each pull bar and operable individually to hold the same against movement from its operative position, of means

for regulating the number of pull bars to be actuated.

12. In a voting machine, the combination with a plurality of pull bars, of means to lock each pull bar individually in its operative position, and means common to all of the pull bars to lock them as a series in their inoperative positions.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

GEORGE STACY.
GEORGE ALFRED JULIUS.

Witnesses:
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ROSS EAST.