F. KEIPER.

VOTING MACHINE.

APPLICATION FILED JULY 24, 1905.

910,389. Patented Jan. 19, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

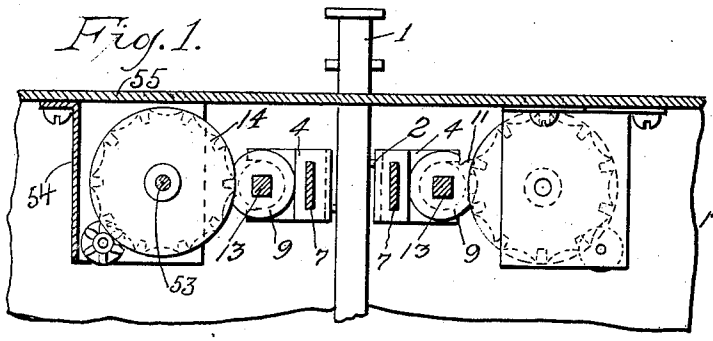


Fig. 3.

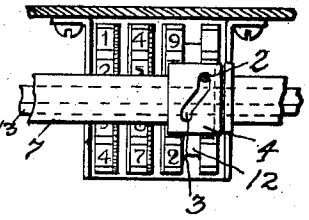


Fig. 2.

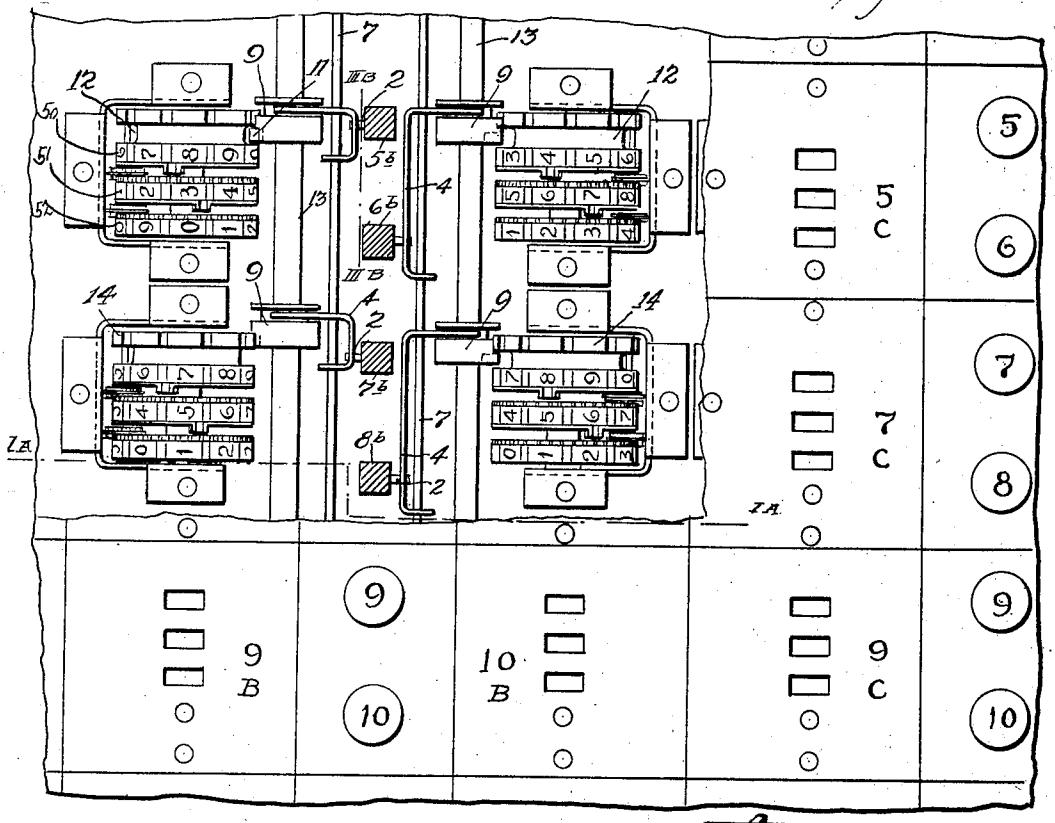


Fig. 4.

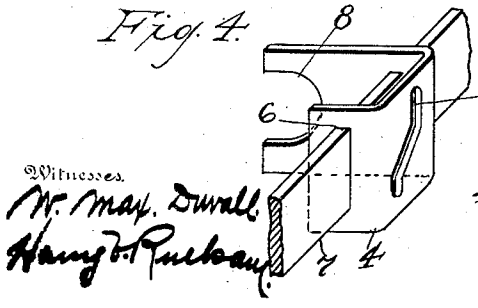
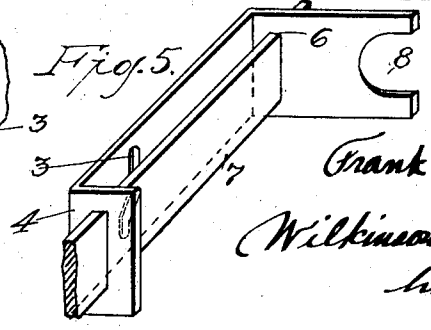


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 10.

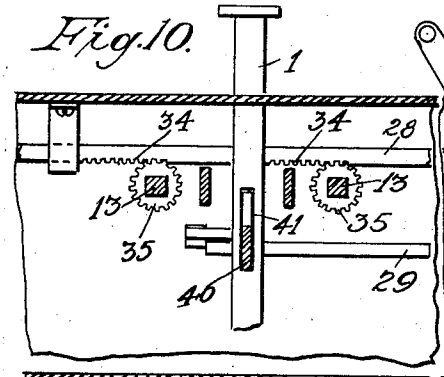
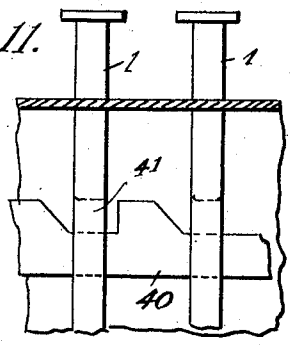
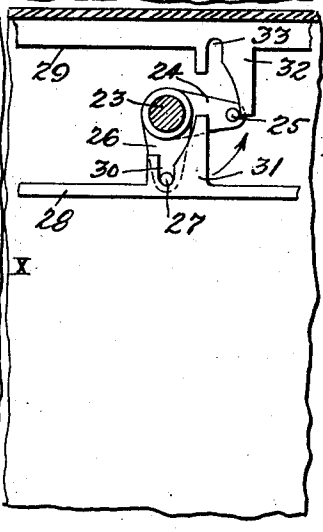


Fig. 11.





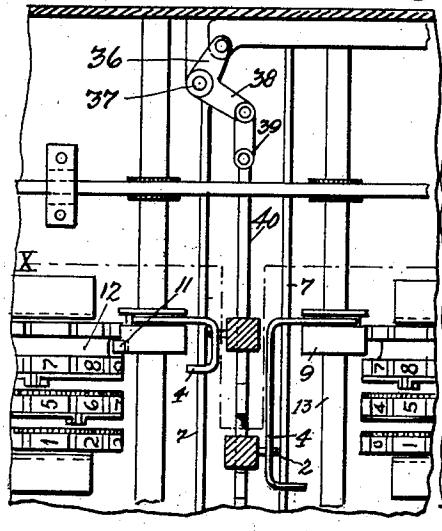


Fig. 12.

Fig. 6.

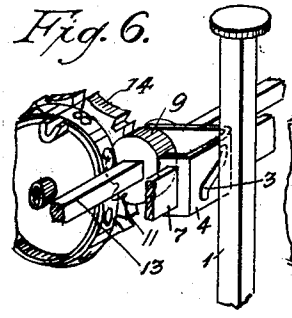


Fig. 7.

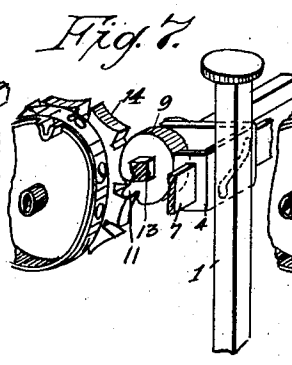


Fig. 8.

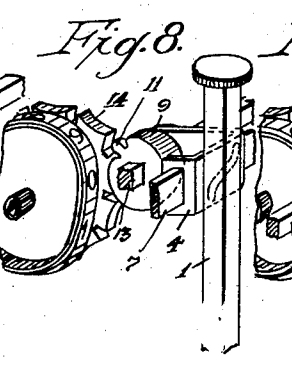
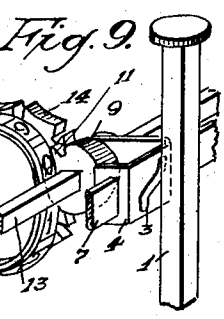


Fig. 9.



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FRANK KEIPER, OF ROCHESTER, NEW YORK.

VOTING-MACHINE.

No. 910,389. Specification of Letters Patent. Patented Jan. 19, 1909.

Application filed July 24, 1905. Serial No. 271,051.

To all whom it may concern:

Be it known that I, FRANK KEIPER, a citizen of the United States, and a resident of Rochester, county of Monroe, State of New York, have invented certain new and useful Improvements in Voting-Machines, of which the following is a specification.

The object of my invention is to get a compact arrangement of the keys and counters in a voting machine and to drive the counters of the voting machine by means of a Geneva stop movement drive, by means of which the counters are positively driven and yet held at all times positively locked by the actuator that drives the counter.

A further object of my invention is to secure such an arrangement of the parts of the voting machine by which the consecutive counters or rather the counters belonging to consecutive keys will be placed alternately on both sides of the party row of keys to which they belong, the even number of the counters being placed on one side of the party row of keys to which it belongs and the odd number of counters being placed on the other side of the party row of keys to which they belong.

In the accompanying drawings, Figure 1 represents a vertical transverse section on the section line I^a, I^a in Fig. 2; Fig. 2 is a top plan view of the machine with a part of the top plate broken away, showing the keys in section and the connection between the keys and counters; Fig. 3 is a side elevation of one of the counters taken on the section line III^b, III^b in Fig. 2; Fig. 4 is a perspective view of the connection between the odd numbered keys and their counter actuators. Fig. 5 is a perspective view of the keys connecting the even numbered keys with their counter actuators. Fig. 6 is a perspective view of the counter and its actuator belonging to an odd numbered key. The actuator and its key are in their normal position ready for voting, and the tooth of the actuator is in line with the groove in the units wheel. Fig. 7 shows the key in voted position and the actuator with its driving tooth in line with the teeth of the units wheel. Fig. 8 shows the actuator driven from the position shown in Fig 7, having advanced the counter one number. Fig. 9 shows the key reset and the actuator in its neutral position, from which it is rocked to position shown in Fig. 6. Fig. 10 is a transverse section of the machine on the line X, X in Fig. 12. Fig. 11 is a side elevation of the keys and the resetting mechanism. Fig. 12 is a horizontal section on a plane immediately under the top plate of the machine as shown in Fig. 10.

In the accompanying drawing like reference numerals refer to like parts.

In the accompanying drawings reference numeral 1, 1 refers to the keys, these keys being numbered consecutively according to the order in which they occur in the various party rows and the party rows being lettered in the order in which they occur on the face of the machine from left to right. In Fig. 1 are shown the keys, which in Fig. 2 are referred to as the keys 7^b and 8^b, the key 7^b being depressed into voted position and the key 8^b being in normal position. The key 1, has at a suitable point thereon a pin 2, which pin engages with the cam slot 3 in the piece 4 connecting the key with the counter actuator 9. The cam slot 3 is so shaped that the actuator is not moved sidewise until the interlock is completed as shown in Fig. 3 of my Patent 898,114 and then the cam acts on the continued movement of the key to place the actuator in driving position for its counter. The piece 4, as is shown in Fig. 4, consists of a single piece of metal bent to a U shape, having therein slots 6, which engage with the guide or bar 7. This bar 7 is stationary and the pieces 4 are free to slide thereon subject to the limitations of their movement imposed upon them by the connection with the key. On the opposite side of the bar from the key the piece 4 has cut therein a U shaped opening or fork 8, the prongs of which straddle and engage with the counter actuator 9, which has a groove 12 therein for that purpose. On said counter actuator 9 is a tooth 11, said tooth being carried on a part of the actuator that is otherwise cylindrical, except where it is recessed at the base of the tooth, similar to the shape of the counter actuator shown in the patent to Dean, 636,730. These counter actuators 5 of the odd numbered keys of a party row are all mounted to slide on a single square shaft, and the sliding movement of said counter actuator is regulated by the operation of the key as hereinafter described. The counter actuator of the even numbered keys in each party row are mounted to slide on a similar shaft. The units wheel 50 of the counter is composed of a single vacuum casting, on one side of which is cast the ten teeth and ten recesses necessary in a counter of this type, and between

the rows of said teeth and the surface which carries the figures is a groove, which may be cast in the wheel or which may be turned in the wheel or may be formed by any other process. In this groove 12 normally rests the tooth 11 of the actuator 9, and the oscillation of this tooth by the shaft 13, as long as the tooth is in this position, can have no effect on the counter. When the tooth is, however, moved to the position shown in connection with the keys 7^b in Fig. 2, the tooth is then in line with the row 14 of Geneva stop movement teeth on the units wheel of the counter, so that on the rotation of said actuator, the counter will be compelled to advance one number. It is understood that the units wheel 50 is geared to the tens wheel 51 and the tens wheel is geared to the hundreds wheel 52 by any suitable form of transfer mechanism that will positively communicate the motion of one wheel to the next and keep all of the wheels securely locked together.

It will be understood that all of the keys of one number belong to candidates for the same office and are suitably interlocked against each other by any of the devices described in my former applications or by the interlock described in the patent to Dean above referred to. Such interlocks not constituting any necessary part of this invention are not shown herein.

In Fig. 5, I have shown a perspective view of the piece connecting the even numbered keys with the counter actuator. In order to keep the counters in the proper positions so that they may all be read from the same point of view, this connecting piece is made much longer, so as to connect with the units wheel of the counter belonging to said key, which is necessarily more remote from the key, it being understood that the units wheel of the counters 5^b and 6^b will occur in the same transverse plane of the machine. This arrangement of the counters with reference to their keys permits the use of large counters in a smaller space than would be otherwise possible. It also enables me to assemble the keys and counters in sections comprising two keys and their respective counters, it being understood that the keys of adjacent sections are associated with each other by the interlocking mechanism and the counters in the lines parallel to the party row of keys are associated by the shaft 13, by means of which their counter actuators are driven, and the keys of each office line are further associated by the bar 40, one of which is provided for each office line for the purpose of resetting the keys. It is further understood that the shaft operating to drive the counter actuator operates immediately on the movement of the operating lever of the machine to drive the counters forward one number for each of said counters whose keys have been placed in voted position, and when this movement has been completed the resetting of the keys by means of the bar 40 takes place, by means of which the tooth of the counter actuator is again placed in line with the groove 12 in the units wheel of the counter, after which it may be rocked back by the shaft 13 to its initial position, from which it is again ready to be moved by the voting of the key for the purpose of further advancing the counter. In this way a four way movement of the counter actuator is secured:—1st. The voting of the key moves the counter actuator from an idle position to an active or potential position, this movement being a sliding movement along the shaft 13; 2nd. A movement due to the rocking of the shaft 13 by which the units wheel of the counter is driven forward one number or step; 3rd. A sliding movement of the counter actuator back to a position in which its tooth is in line with the groove 12 in the units wheel of the counter; 4th. A backward oscillation of the shaft 13 by which the tooth is moved to its original position. The first movement is secured by the voting movement of the key; the second movement is secured by the rocking of the shaft 13 in one direction; the third movement is secured by the resetting of the key, and the fourth movement is secured by the rocking of the shaft in the reverse direction. The coördination of the parts of the machine for securing these consecutive functions will now be described

In Fig. 10 is shown the operating lever 20 of the machine, keyed to a shalt *a* which supports the bevel gear 21, meshing with the bevel gear 22, which bevel gear in turn is keyed to a shaft 23. Keyed to the shaft 23 is an arm 24, which arm carries thereon a pin 25. The shaft 23 also carries thereon an arm 26 having a pin thereon 27. Mounted on one side of said shaft is the sliding rack bar 28, and mounted on the other side of said shaft is the sliding bar 29. Carried on the bar 28 or integral therewith, is the plate 31, having an open ended slot 30 therein, in which slot engages the pin 27 on the arm 26. When the shaft 23 moves in the direction shown by the arrow in Fig. 12, the bar 28 is driven to the right by means of the crank 26 and the pin 27, and when the pin 27 reaches the curved portion of the plate 31, the bar 28 remains stationary and is held against backward movement. On the bar 29 is a similar plate 32, with which engages the pin 25 on the crank 24. When the shaft 23 begins to turn and the pin 27 is moving the bar 28 to the right, the pin 25 is traveling along the curved portion of its plate 32, holding the bar 29 stationary, and after the bar 28 has ceased to move endwise, the pin 25 engages with the slot 33 and the plate 32 and begins to move the bar 29 to the left. In this way the successive move-

ment of these two bars is secured and at the proper time. At suitable intervals, as shown in Fig. 12, the bar 28 has racks 34, 34 cut therein, with which mesh the pinions 35, 35, which pinions are mounted on the square shafts 13, 13, which shafts carry the actuators of the counters. The sliding bar 29 is pivoted at suitable intervals to bell cranks 36, one of said bell cranks being provided for each party row of keys. Each of said bell cranks is pivoted on a stud 37 and at the end of its long arm 38 is connected to a link 39, which in turn is pivoted to a sliding cam bar 40. This sliding cam bar by its forward movement in the direction shown by the arrow in Fig. 12, causes the positive resetting and the locking of the keys. This cam bar has at suitable intervals thereon one cam for each key of its party line. The bar passes through a slot 41 in each key and the longitudinal movement of said bar through the keys will raise all of those that have been depressed. This raising of the keys, as will be seen, does not take place however until after the rocking of the shaft 13 has been completed, so that the counter actuators are then in the position shown in Fig. 8. The subsequent resetting of the keys by the bar 40 moves the counter actuators to the position shown in Fig. 9, and the operation of the lever 20 preparatory to voting moves the counter actuators to the position shown in Fig. 6. It will thus be seen that the voting of the key moves the counter actuator from the position shown in Fig. 6 to that shown in Fig. 7. The first part of the movement of the operating lever 20 causes the oscillation of the actuator from the position shown in Fig. 7 to the position shown in Fig. 8, the further movement of the lever 20 moves the actuator to the position shown in Fig. 9 and the reverse movement of the lever moves the actuator to the position shown in Fig. 6.

The wheels 50, 51 and 52 of the counters are mounted to turn on the shafts 53, which shafts are supported by bearings in the brackets 54, which brackets in turn are fastened to the cover plate 55, so that the periphery of the counter wheels 50, 51 and 52 are carried at a uniform distance from the cover plate 55, which distance is but little more than the radius of the cylindrical numbered surfaces of the counter wheels, leaving the smallest possible clearance between the counter wheels and the cover plate 55. The numbered surfaces of the counter wheels come directly under and in line with the sight openings of the cover plate shown in Fig. 2.

Having thus described my invention, what I claim as new and patentable is as follows:—

1. In a voting machine, the combination of a series of keys arranged in a party line, single axis counters for said keys, each of said counters having a units wheel provided with a cylindrical surface, with ten digits marked thereon, said units wheel also having a gear composed of ten driving and locking teeth, said wheel being also provided with an annular groove between said gear and said cylindrical surface, said counters being arranged on each side of said line of keys, and counter actuators, the odd numbered keys in said line of keys being designed to operate the actuators for the counters on one side of said line and the even numbered keys being designed to actuate the actuators for the counters on the other side of said line, substantially as described.

2. In a voting machine, the combination of a plurality of series of keys, each series being arranged in a party line, counters for each series of keys arranged on each side of said party line, each of said counters being a single axis counter and having therein a units wheel provided with a cylindrical surface with ten digits marked thereon, said units wheel also having a gear composed of ten driving and locking teeth, said wheel being also provided with an annular groove between said gear and said cylindrical surface, and counter actuators, the odd numbered keys in the party line being designed to operate the actuators for the counters on one side of said line and the even numbered keys being adapted to operate the actuators of the counters on the other side of said line, substantially as described.

3. In a voting machine, a units wheel for a decimal counter, having a cylindrical surface with ten digits marked thereon, said wheel also having a gear composed of ten driving and locking teeth and provided with an annular groove between said gear and said cylindrical surface, said gear having no diameter greater than the greatest diameter of the rest of the wheel, a driving and locking means for said wheel including a four-way movement actuator, with a single driving tooth thereon adapted, when in inoperative position, to lie in said groove, said actuator moving across the face of the units wheel and oscillating in correspondence with it and holding said wheel locked during its oscillation, substantially as described.

4. In a voting machine, a units wheel for a decimal counter, having a cylindrical surface with ten digits marked thereon, said wheel also having a gear composed of ten driving and locking teeth and provided with an annular groove between said gear and said cylindrical surface, said gear having no diameter greater than the greatest diameter of the rest of the wheel, a driving and locking means for said wheel including a four-way movement actuator, with a single driving tooth thereon adapted, when in inoperative position, to lie in said groove, said actuator moving across the face of the units wheel and

oscillating in correspondence with it and holding said wheel locked during its oscillation, and a cover plate whereby a uniform clearance between the cover plate of the counter and both the numbered surface and driving gear of the units wheel is secured, said cover plate extending parallel to the axis of the counter, substantially as described.

5. In a voting machine, a units wheel for a decimal counter, having a cylindrical surface with ten digits marked thereon, said wheel also having a gear composed of ten driving and locking teeth and provided with an annular groove between said gear and said cylindrical surface, said gear having no diameter greater than the greatest diameter of the rest of the wheel, a driving and locking means for said wheel including a four-way movement actuator, with a single driving tooth thereon adapted, when in inoperative position, to lie in said groove, said actuator moving across the face of the units wheel and oscillating in correspondence with it and holding said wheel locked during its oscillation, and a cover plate whereby a uniform clearance between the cover plate of the counter and both the numbered surface and driving gear of the units wheel is secured, said cover plate extending parallel to the axis of the counter, and a longitudinally movable key for said counter, said key being movable in a plane transverse to the axis of the counter, substantially as described.

6. In a voting machine, the combination of a longitudinally movable key with a pin thereon, a U-shaped traveler having a cam groove therein with which said pin engages, a bar supporting said traveler, an actuator having an annular groove engaged by said traveler, a square shaft on which said actuator is free to slide except as controlled by said traveler, said shaft being capable of oscillating with its traveler, and a Geneva stop movement counter engaged by said actuator and by which actuator said counter is either driven or locked, substantially as described.

7. In a voting machine, the combination of counters, longitudinally movable keys arranged in pairs, each key having a pin thereon and said pins extending in opposite directions, a U-shaped traveler for each key having a cam groove cut therein with which the pin of the corresponding key engages, a bar supporting each of said travelers, an actuator having an annular groove engaged by said traveler, a square shaft on which said actuator is supported, said actuator being free to slide on said shaft except as controlled by said traveler, said shaft being capable of oscillating with its actuator, a Geneva stop movement counter engaged by said actuator and by which actuator said counter may be driven in either direction or locked, said pair of keys being arranged between the travelers, actuators and counters belonging thereto and between the guides and shafts supporting said parts, substantially as described.

8. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, each of said counters having a units wheel provided with a cylindrical surface with ten digits marked thereon, said wheel also having a gear composed of ten driving and locking teeth, said wheel being also provided with an annular groove between said gear and said cylindrical surface, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft.

9. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, each of said counters having a units wheel provided with a cylindrical surface with ten digits marked thereon, said wheel also having a gear composed of ten driving and locking teeth, said wheel being also provided with an annular groove between said gear and said cylindrical surface, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot

verse to the actuator shaft causes a movement of its actuator along the actuator shaft.

10. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, said means consisting of a single rack bar, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft.

11. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, said means consisting of a single rack bar, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft, a single means for resetting and locking all of the keys in a row.

12. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, said means consisting of a single rack bar, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft, a single means for resetting and locking all of the keys in a row, said means comprising a sliding bar having cams thereon one for each key.

13. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and a U-shaped traveler provided with a cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft, a bar parallel to each actuator shaft supporting the connections between the keys and their actuators said traveler being perforated to embrace the supporting bar.

14. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, connections between the even numbered keys and their actuators and

counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and a U-shaped traveler provided with a cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft, a bar parallel to each actuator shaft supporting the connections between the keys and their actuators said traveler being perforated to embrace the supporting bar.

15. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, said means consisting of a single rack bar, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft, a bar parallel to each actuator shaft supporting the connections between the keys and their actuators.

16. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving in right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, said means consisting of a single rack bar, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft, a single means for resetting and locking all of the keys in a row, a bar parallel to each actuator shaft supporting the connections between the keys and their actuators.

17. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, said means consisting of a single rack bar, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft, a single means for resetting and locking all of the keys in a row, said means comprising a sliding bar having cams thereon one for each key, a bar parallel to each actuator shaft supporting the connections between the keys and their actuators.

18. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, said means consisting of a single rack bar, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising means whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft, a single means for resetting and locking all of the keys in a row, said resetting means

being delayed in its operation until after the oscillating movement of the counter actuator shafts has been completed.

19. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axes of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft supporting and driving all the actuators of its row of counters, means for driving said oscillating shafts in unison, said means consisting of a single rack bar, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections consisting of a U shaped piece having a cam shaped slot cut therein, which slot is engaged by a pin on the voting key, said connections also having a fork engaging an annular groove in the actuator, controlling the longitudinal movement of said actuator but leaving said actuator free for oscillating movement, a stationary bar on each side of the row of keys, said bar supporting the said connections of the actuators adjacent thereto.

20. In a voting machine, the combination of a plurality of single axis counters arranged consecutively in pairs in two parallel rows, each of said counters having a units wheel provided with a cylindrical surface with ten digits marked thereon, said wheel also having a gear composed of ten driving and locking teeth, said wheel being also provided with an annular groove between said gear and said cylindrical surface, keys for said counters arranged in a single row between said rows of counters, said keys moving at right angles to the axis of said counters and the shafts of their actuators, an actuator for each counter and having a four way movement for driving and locking said counter, two oscillating shafts one for each row of counters, each shaft being connected to and driving all the actuators of its row of counters, connections between the even numbered keys and their actuators and counters on one side of said row of keys, similar connections between the odd numbered keys and their counters on the other side of said row of keys, said even and odd numbered keys being shaped substantially alike, said connections comprising a pin and cam slot whereby the movement of the key transverse to the actuator shaft causes a movement of its actuator along the actuator shaft.

In testimony of which, I have hereunto set my hand and seal in the presence of two witnesses.

FRANK KEIPER. [L. S.]

Witnesses:
CHARLES EDELMAN,
WILLIAM T. ROGERS.