

No. 620,417.

Patented Feb. 28, 1899.

J. E. CHAPIN.  
VOTING MACHINE.

(Application filed May 26, 1897.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 2.

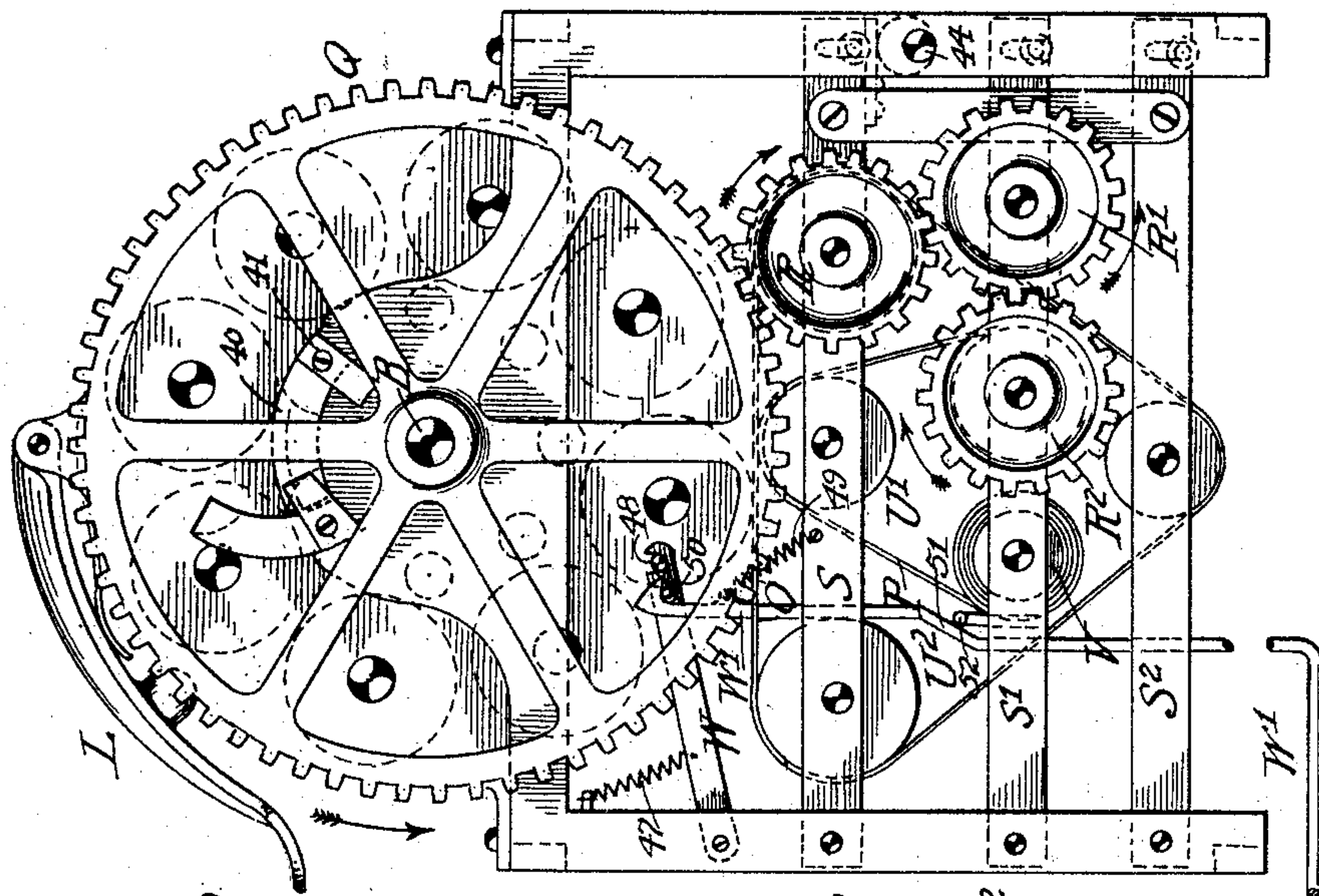
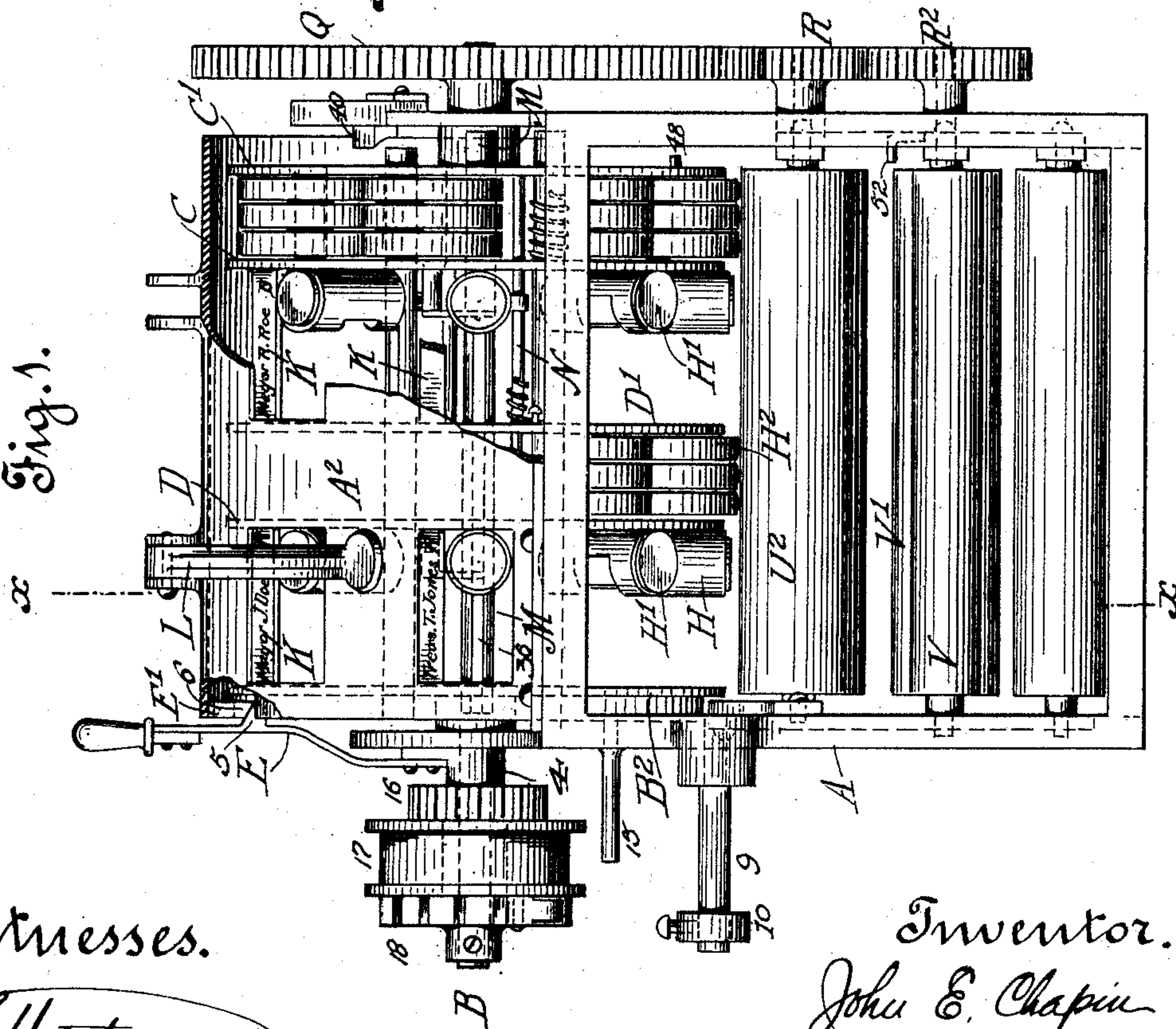


Fig. 1.



Witnesses.

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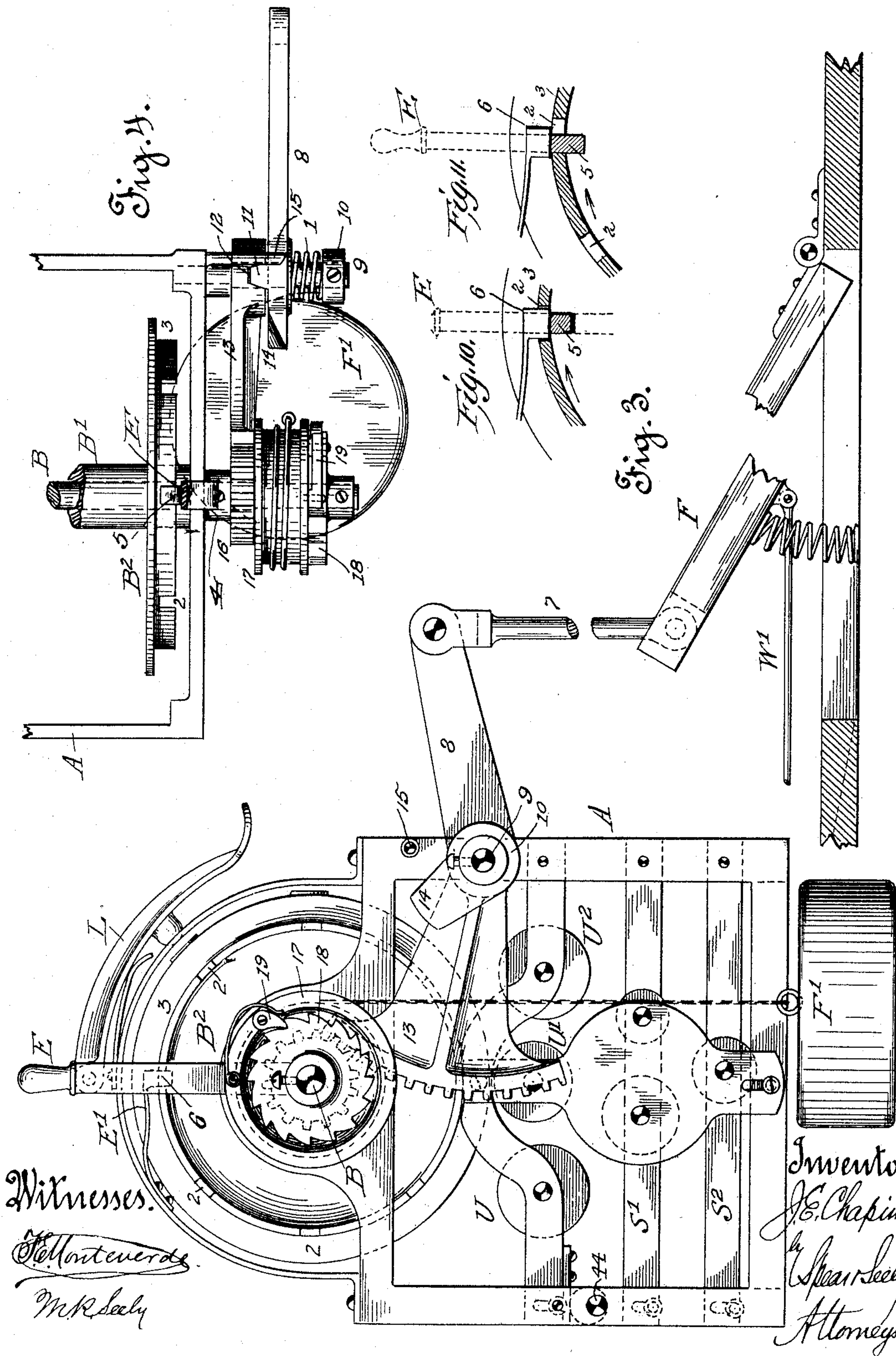
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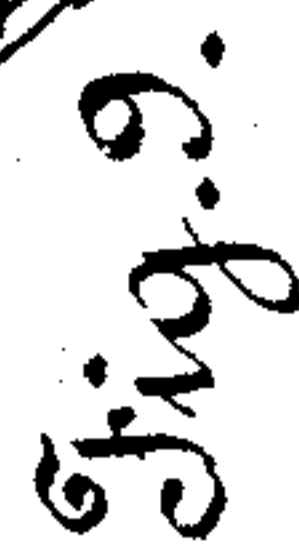
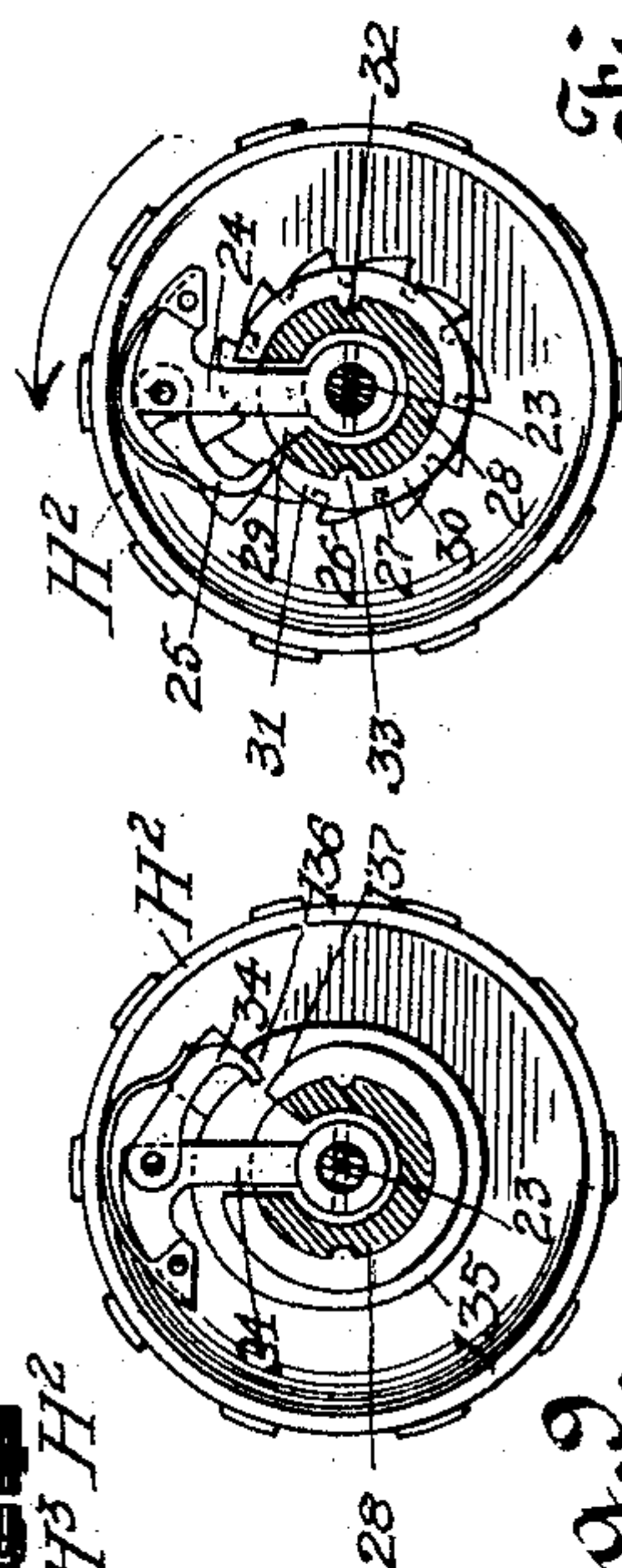
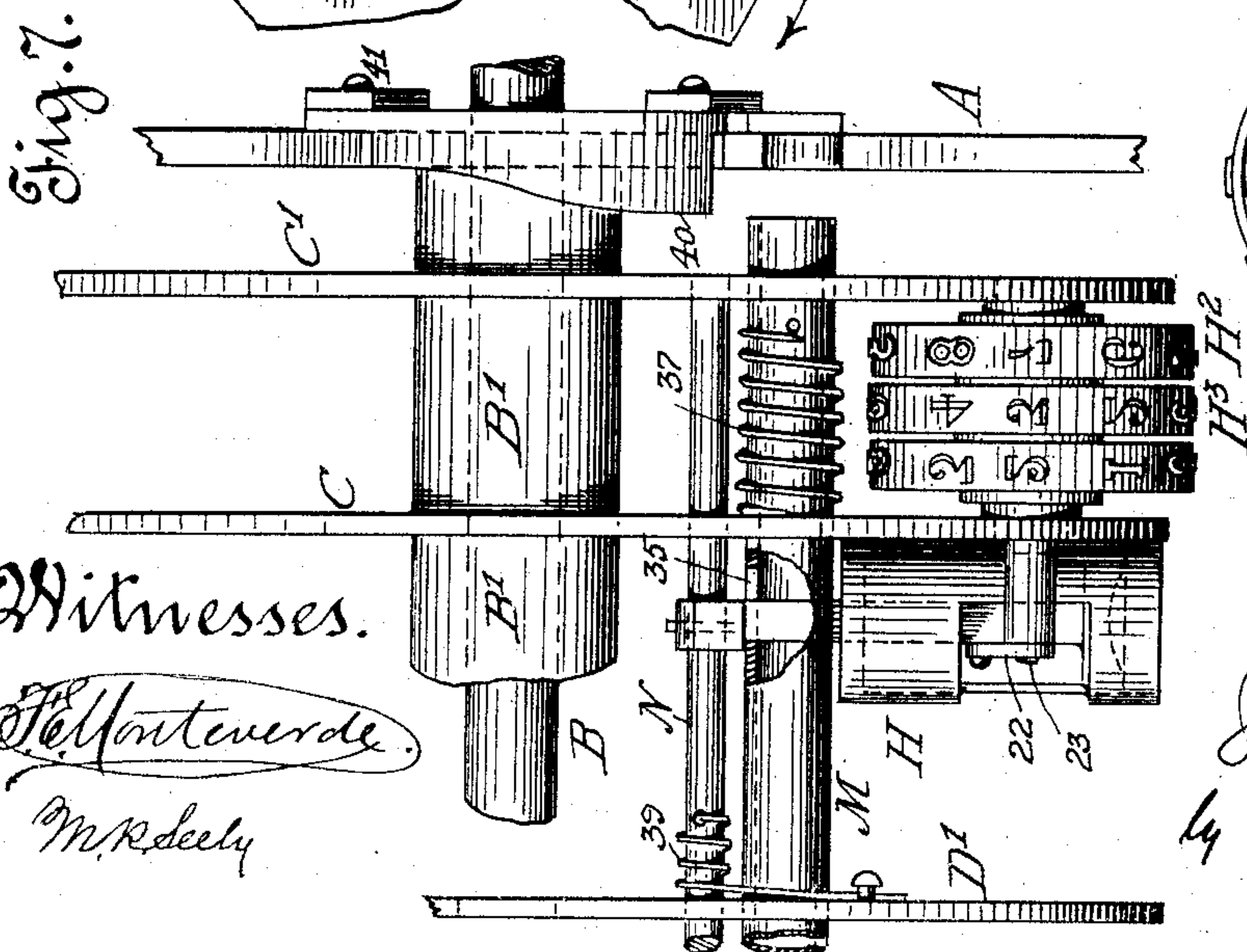
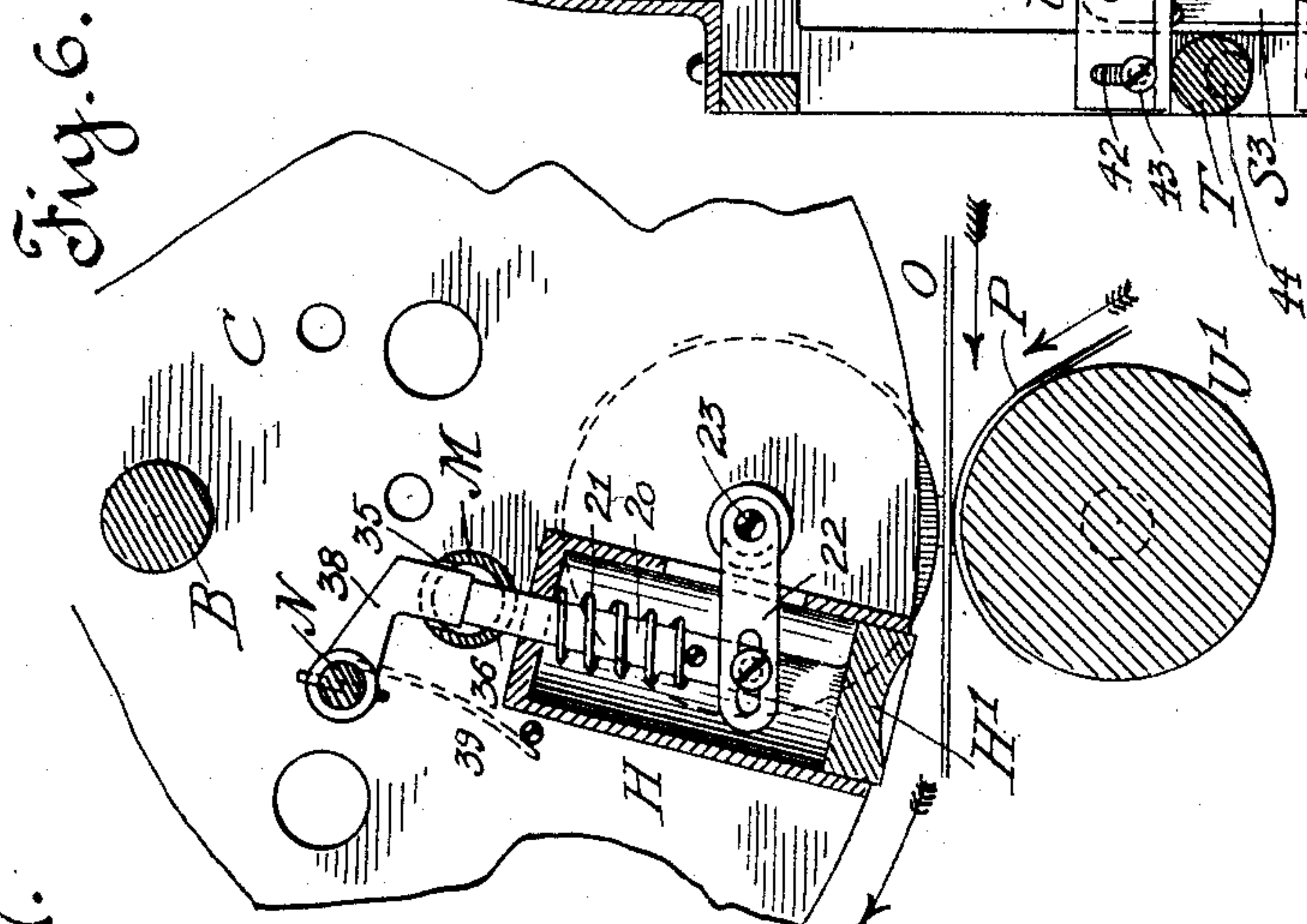
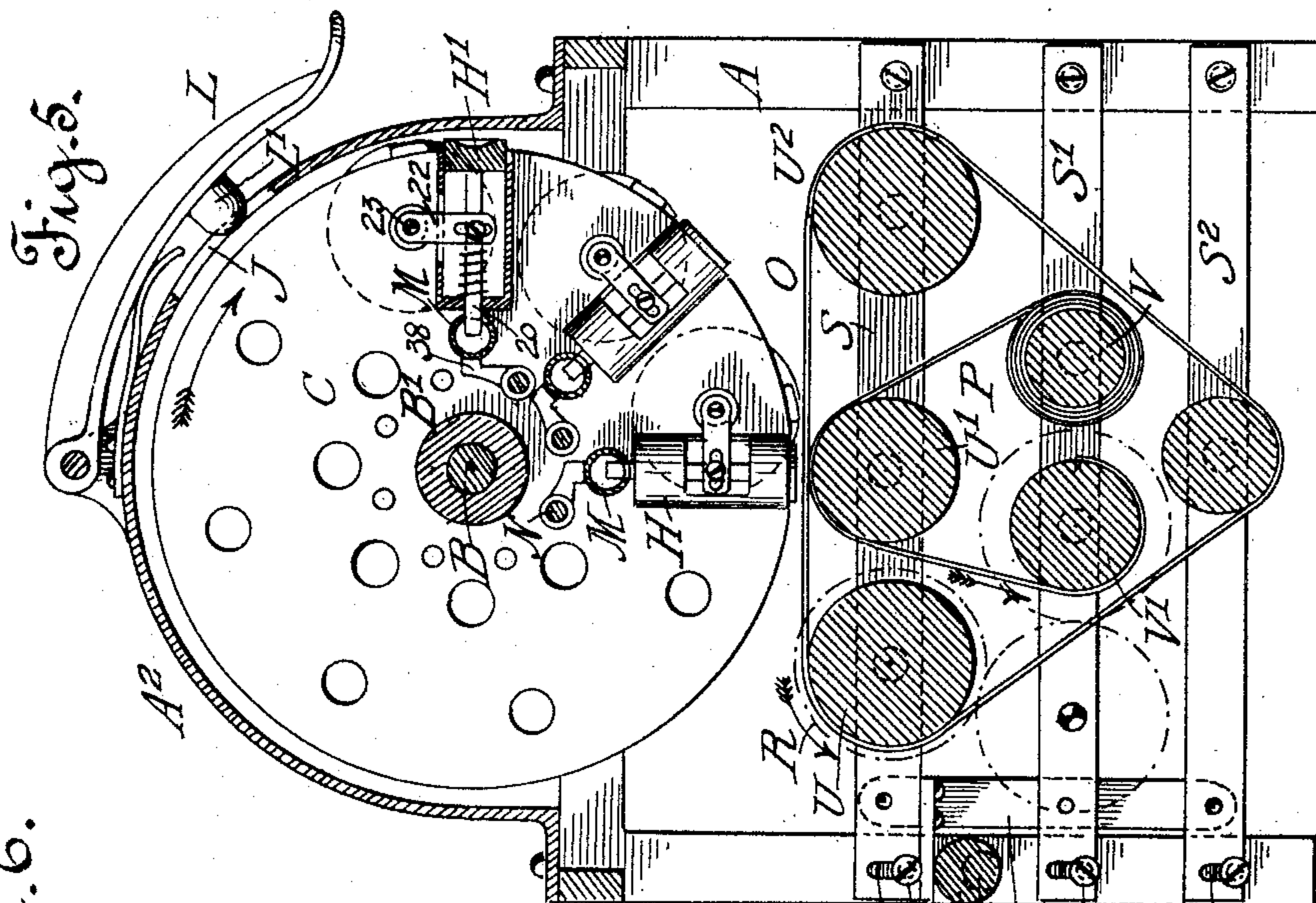


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(No Model.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

JOHN E. CHAPIN, OF NORTH FORK, CALIFORNIA.

## VOTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 620,417, dated February 28, 1899.

Application filed May 26, 1897. Serial No. 638,257. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. CHAPIN, a citizen of the United States, residing at North Fork, in the county of Madera and State of California, have invented certain new and useful Improvements in Voting-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to machines for enabling voting to be done mechanically; and my object is to produce a connected mechanism which will commence and continue to register automatically the successive votes for a series of candidates on different political tickets.

My object is further to provide means for printing the footings or totals of votes cast for each and every candidate at the end of the election, so that all counting of votes can be done away with. The machine is hence a combined voting and vote-counting device, by the use of which the result of the vote in any precinct can be known with mathematical correctness immediately at the close of the voting, all the names and totals being recorded upon a slip by a printing mechanism, forming part of the machine, and brought into use after the vote-registering devices have completed their work.

I have embodied my invention in a mechanical structure which fully illustrates its construction and operation and which is fully hereinafter described and is shown in the drawings accompanying this specification.

In the drawings, Figure 1 is a front elevation of the machine with the shell broken away in parts. Fig. 2 is an end elevation showing the driving-gearing for the recording device. Fig. 3 is an opposite end elevation. Fig. 4 is a plan view of the mechanism shown in Fig. 3. Fig. 5 is a central vertical section of Fig. 1. Fig. 6 is a detail view of one of the push buttons or studs and the mechanism directly connected to it for numbering the votes. Fig. 7 is an enlarged detail elevation of part of Fig. 1. Figs. 8 and 9 are details of two of the numbering-disks. Figs. 10 and 11 are detail views to illustrate the operations of the hand and automatic latches for locking and releasing the rotary voting mechanism.

The apparatus is shown as supported by a frame A, in the upper part of which is jour-

naled a shaft B. This shaft is intended to be turned automatically but intermittingly during the process of voting, by which I mean that such shaft is under the control of the voter so far as permitting it to start after each automatic stoppage is concerned.

The shaft B carries a number of voting-disks C C' D D', spaced by short sleeves B', Fig. 7. These disks are arranged in pairs, as shown, and each pair may be supposed to represent one political party or its ticket. In the drawings I have shown two of such pairs only for the sake of simplicity. Near one end of the shaft is mounted a single disk B<sup>2</sup>, having a series of notches 2, formed in a flange 3, projecting from said disk, Figs. 1 and 4. As many of these notches are provided as there are offices to be filled upon the different tickets.

E, Figs. 1, 3, and 4, is a spring-arm provided with a handle and secured to a sleeve 4, loose on the shaft B and just outside the end frame of the machine. The arm E is a spring-latch by reason of its tooth 5, which has a beveled upper surface and which tends to engage by the spring action of said arm with the edge of the disk B<sup>2</sup> or one of the notches 2 in such edge. This latch E is the means by which the voter controls the starting of the machine after each automatic stoppage. It must be understood that the shaft B is run by a motor for a full revolution, during which a number of votes are cast or registered, but that such shaft is stopped while the votes are being cast. If this latch E is in engagement with a notch 2, the shaft cannot start. Hence the voter positively disengages the latch from the notch, and the machine commences to operate, the latch riding on the plain edge of the disk B<sup>2</sup> until it springs into the next notch and stops the machine. This would produce an automatic stoppage of the machine unless the voter accidentally or intentionally held out the latch E until the next notch or any number of notches had passed, and as it would be in his power to so hold out the latch the machine might make its full revolution without stopping and without any votes having been cast. I therefore provide a second and completely-automatic spring-latch E', which is secured to and concealed under the inclosing shell A<sup>2</sup>, which covers the operative



mechanism, Figs. 1 and 3. This latch E' is a spring-arm having a tooth which always tends to engage the notches 2 and will do so if the latch E shall have been held out. This safety or automatic latch can, however, be disengaged by the beveled tooth of the latch E, as shown in Fig. 1, after it has stopped the machine. The voter can therefore control the release of the latch E'; but he cannot prevent its engagement without engaging the latch E, which produces the same result. This operation will be more clearly understood by referring to Figs. 10 and 11. The tooth 5 of latch E is not so wide as the notch 2 or as the tooth 6 of latch E'. When the latch E is engaged with the notch by hand, it lifts latch E'. Means hereinafter described for revolving the shaft and voting-disks act at once, causing the wall of the notch to bear against tooth 5, Fig. 11, so that latch E' rides upon the plain face of flange 3 and remains there until it falls into the next notch after the voter has released latch E, Fig. 10. From this it is released by the entering beveled tooth of the hand-latch, so that the parts again assume the position of Fig. 11.

The voting is done by pressing successive push-buttons, each of which is connected to a numbering and counting attachment. These push-buttons are carried around by the rotation of the main shaft and disks, so that a single rotation enables the whole ticket to be voted or parts of different tickets. These devices will be fully described; but in the first place I wish to describe a particular mechanism for rotating the shaft, to which, however, I do not limit myself, since other means of imparting motion may be employed. My device, however, has the merit of simplicity and of being driven by a power which exhausts itself while a person is voting and is renewed and then exhausted automatically by his successor. I prefer this means to any constantly-running motor, which is liable to break down or become finally exhausted before the day's voting is finished. In describing this mechanism I refer particularly to Figs. 3 and 4 in connection with Fig. 1.

When a voter enters the polls and approaches the machine to vote, he steps upon a hinged platform F, pivoted at the edge of an opening in the main flooring. To this hinged platform is pivoted a rod 7, connected to a lever 8, having a bearing upon a pin 9, projecting from the main frame. The lever 8 is loose upon the pin, and a coil-spring 1 is interposed between it and a collar 10 on the end of pin 9, Fig. 4. A tooth 11 projects sideways from the lever, which engages with a recess 12 in the hub of a quadrant 13, journaled on the pin 9. A depression of lever 8 will raise the quadrant 13 until a beveled projection 14 on lever 8 strikes a small fixed pin 15 on the frame and forces the lever outward the end collar 10. This action is timed to occur as the hinged floor reaches a horizontal position, at which time the lever 8 becomes

disengaged from the recess in the quadrant, and as the quadrant immediately commences to move in the opposite direction (as will be presently explained) the tooth 11 rides on the face of the hub until the recess comes again into position to allow the tooth 11 to snap into it. The first motion of the quadrant, produced by standing on the hinged floor, is to wind up the weight F', which is the motive power for creating a single revolution of the main shaft and voting-disks. To accomplish this, the quadrant gears into a pinion 16, loose on the main shaft and formed in one part with a drum 17. A ratchet-wheel 18 is fixed on the end of the shaft and engages a pawl 19, carried by the drum. The motion of the pinion and drum winds up the cord of the weight F'. The running down of this weight communicates motion to the ratchet-wheel, shaft, and voting-disks, which motion is automatically stopped by the latches before described. The voter on approaching the machine steps upon the movable platform and depresses it, winding up the weight. Should he step off the platform and return to it, no effect is produced upon the mechanism, since the shaft must make a complete revolution before the lever connected to the weight can again engage with the lifting-quadrant. The weight causes the shaft to turn, the latch E having been disengaged by the voter. The disk B<sup>2</sup> will hence be moved a distance equal to the space between two of its notches 2, when it will be stopped by the latch E snapping back into the next of such notches. Should the voter hold out the latch E, the latch E' will automatically stop the disk and shaft and must then be disengaged by pushing the latch E under it and into said notch, as before described. The mechanism thus far described for moving the shaft and disks intermittently might be dispensed with, since it is evident that a hand-pull on the latch E would produce the same effect in connection with the latch E', acting as a stop; but I prefer to use the weight or some equivalent power, because it makes the machine more nearly automatic and leaves less to be done by the voter.

The voting-disks C C' D D' have been already mentioned as mounted on the shaft and moving with it. Each pair of disks, representing a party-ticket, carries a number of registering and counting wheels bearing the numerals from "1" to "0," inclusive, and arranged preferably in sets of three, so as to count into hundreds, which is an ample range for ordinary precinct use. In the drawings eight of these registers are shown to each pair of disks, representing eight candidates upon each of two tickets. Secured to each disk is a series of eight cylinders H, each having a sliding push-button H', the stem 20 of which has a spring 21, which tends to force it outward. The stem is connected by a slotted crank 22 to the central shaft 23 of the appropriate units-wheel H<sup>2</sup>. Figs. 6 and 7 show this



connection clearly. Hence a depression of any button will revolve the units-wheel the distance from one numeral to the next. The construction of this wheel is shown in Figs. 8 and 9, which figures represent opposite elevations of it, Fig. 8 showing its right-hand face (as looked at in Fig. 7) and Fig. 9 its left-hand face in the same figure. An arm 24 is fixed upon the shaft 23, which carries a spring-pressed pawl 25, adapted to engage with ratchet-teeth 26, formed upon the face of wheel  $H^2$  and having notches 27 at their base. All the wheels of the series are loose upon a slotted sleeve 28, the slot 29 of which is wide enough to give the arm 24 a sufficient range of movement as the shaft 23 is rocked by the pressure and release of the push-button. When the button is pushed in, the pawl 25 moves in the direction of the arrow, Fig. 8, and turns wheel  $H^2$  a distance equal to one tooth of the ratchet 26. A collar 30, slightly eccentric at 31, is fixed upon the sleeve 28, grooves 32 being formed in said sleeve to receive feathers 33 on said collar. The pawl 25 in moving the ratchet rides upon the edge of collar 30 until the eccentric 31 lifts it from a notch 27 at the end of its stroke. On the release of the push-button the pawl 25 moves back and seizes the next tooth of the ratchet. Fig. 9 represents the opposite side of the same wheel and shows the connection between the units-wheel  $H^2$  and the tens-wheel  $H^3$ . An arm and pawl 34, similar to pawl 25, is secured upon shaft 23 between the two wheels. On the units-wheel is another ratchet 135, which has but a single tooth 136, upon which the pawl 34 rides until it can engage with said tooth, such engagement permitting it to engage at the same time with a ratchet on the tens-wheel exactly like the ratchet 26, before described. The sleeve is provided with a disengaging-eccentric 137, like that shown at 31. The pawl 34 can hence move the wheel  $H^3$  but once for ten movements of the wheel  $H^2$ . The connection between the tens-wheel and the hundreds-wheel is precisely similar and operates in the same way. Above the main frame is secured the shell or cover  $A^2$ , which protects the mechanism from inspection and prevents any tampering with the registers. As the main shaft and voting-disks stop at proper intervals, as before described, each button is displayed opposite a slot J in this shell, together with a name-plate K, secured to the disk and bearing in letters the name of a particular person and of the office for which he is a candidate. These buttons may be operated by the fingers of the voter directly; but I prefer to use pivoted levers L, one for each series of buttons and registers, and having a stud  $L'$ , which is brought to bear upon the successive buttons as they are displayed. The voter holding this lever in one hand and the latch E in the other has only to move the latch from one notch and then press the button,

when the machine stops at the next notch. This registers a vote on the numbering-wheel appropriated to that office, candidate, and ticket. He continues the same proceeding until the machine has made its full revolution, during which he has seen displayed the names of all candidates and all offices on all tickets and has voted for as many as he has desired to do, the machine having while at rest displayed each office and candidate in succession and all the different candidates for the same office at the same time. The registers are automatically counting the successive votes until when election is over each set of registers shows the total of votes cast for a particular candidate.

In order to lock the push-buttons and prevent repetitions of a vote cast by means of any one of them, I have devised certain automatic locking mechanism. (Shown in Fig. 1 and in full detail in Figs. 6 and 7.) Extending through holes in all the voting-disks are sliding tubes M, having oppositely-placed slots 35 and 36 and provided with pressure-springs 37, which tend to force them constantly toward the end of the machine. (Shown in Fig. 7.) As many of these tubes are provided as there are push-buttons for each disk, there being eight shown in the present case. Adjacent to each tube and also held loosely in bearings in the voting-disks is a rock-shaft N, carrying a latch 38 and acted upon by a torsion-spring 39, coiled upon said rock-shaft and secured to an adjacent disk. The tendency of spring 39 is to cause the latch to engage with the short slot 35, Fig. 6. The stems of all the push-buttons adjacent to one of these tubes project through the long slot 36 and into the tube. In the normal position of these parts and except while a vote is being registered the slot 35 is out of line with the stem of the push-button and with the latch 38, the spring 37 having pushed the tube toward the end of the machine. Pivoted to the end frame of the machine is a cam 40, against which the projecting end of each tube M bears once in each rotation of the disks. This cam forces the tube inwardly until the latch 38 can snap into slot 35, Fig. 6, and lock the tube. The slot is somewhat longer than the width of the latch, and the latch is somewhat wider than the stem of the push-button, Fig. 7. The disk stops with the push-button opposite the voting-slot. When the voter presses the button, its stem enters the slot 35 and pushes the latch out of the same. The slight difference in width between the stem and latch allows the tube to be moved slightly to the position of Fig. 7, so that when the button is released the latch 38 is held out of the slot 35 and the tube is forced by its springs 37 back to its normal position, so that it strikes the cam again on its next revolution. This takes place simultaneously with the release of the button, and hence no second pressure by the same voter can occur, the stem being now locked



by the solid wall of the tube and remaining locked until the next revolution causes the cam to unlock that button.

At the close of the voting each register indicates the full number of votes cast for a certain candidate and the push-buttons are all locked. The election officers now prepare to record the vote by printing the names and totals upon a paper strip, and this is done by the machine by mechanism which hitherto has not come into operation. In the first place the cam 40 is moved upon its pivot 41, so as to be out of the path of the tubes in order that the push-buttons cannot possibly be unlocked and operated while the recording of the vote is being done. The recording devices are best shown in Figs. 2 and 5. The counting-wheels and the name-plates adjacent to them carry upon rubber strips or otherwise numbers and names in negative relief from which a positive print can be made.

The printing mechanism is operated by giving a single rotation to the main shaft, disks, and locked counting-wheels, which causes such wheels to print off their totals through an ink-ribbon O, or by being inked themselves upon a strip of paper P. The ink-ribbon shown and the paper strip are carried by rollers beneath the voting mechanism, which are driven by gearing, as shown in Fig. 2. On the main shaft is a large gear Q, adapted to be engaged by a pinion R of the train R R' R<sup>2</sup>. These pinions are journaled in bars S S' S<sup>2</sup>, pivoted at their forward ends to the main frame and having their rear ends adjustable in said frame by means of slots 42, which receive pins 43, projecting from said bars. The bars are also connected by a cross-bar S<sup>3</sup>, which causes them to move simultaneously. An eccentric T is fixed upon a shaft 44, journaled in the main frame at its rear, by turning which the pinion R can be either engaged or disengaged from the driving-gear. During the operation of voting the train of gears is idle. The ink-ribbon is shown as running upon three rollers U U<sup>2</sup> U<sup>3</sup>, the former being upon the shaft of gear R and the others being journaled in the bars S and S<sup>2</sup>. The paper strip is also carried by three rollers U' V V' and is shown as wound upon the roller V and adapted to be wound from that roller upon the roller V'. The ink-ribbon and paper strip move in the same direction across the roller U' toward the rear of the machine. When the counting-wheels are locked and the gears engaged, a single revolution of the main shaft will cause every wheel and name-plate to strike the ink-ribbon above the paper strip on the roller U' and to impress upon such paper strip the names and totals of all the votes cast.

It is obvious that at any time during the election, if required to do so, the election officers can stop the voting for a few minutes and record the progress of the voting up to that time by giving the shaft a revolution

with the gears engaged and the counting-wheels locked.

As a precautionary device to prevent a voter from allowing the machine to make a second revolution and so voting twice I have devised a safety-catch W, which automatically locks the driving-shaft and disks after each revolution. This catch is pivoted in the main frame and is pulled by a spring 47 into engagement with a stud 48 on one of the voting-disks, which it locks against movement in either direction. An arm W', having a hooked end, is pulled by a spring 49 into engagement with a stud 50 on the catch W. The arm W' is connected to the hinged platform. At any convenient point on said arm is formed an incline 51, which when the platform is depressed acts as a cam against a fixed pin 52 on the main frame. In the operation of these connections the movement of the hinged platform first pulls the arm W' down far enough to release the catch W from the stud 48, so that the voting apparatus is permitted to revolve. As soon as the catch W has been released the cam 51 striking the pin 52 causes the arm W' to release the stud 50 and permits spring 47 to pull catch W into position to engage with stud 48 again when the voting apparatus has completed its revolution. When the platform rises, the arm W' rises also, and its end reengages with the stud 50.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a voting-machine, and in combination, a shaft carrying voting-disks, sets of counting-wheels mounted upon said disks, each set having an individual operating-button, means for rotating the shaft and disks, means for stopping said shaft at intervals to enable the sets of numbering-wheels to be operated successively, means under control of the voter for permitting said shaft to move after each stoppage, and means for automatically locking and releasing said operating-buttons, substantially as described.

2. A voting-machine comprising a rotary shaft and voting-disks thereon, carrying sets of counting-wheels, means for rotating and stopping said shaft and means for operating, locking and releasing said wheels, in combination, with rollers carrying a paper strip, inking devices, gearing between the main shaft and said rollers and means for engaging and disengaging said gearing from said shaft, substantially as and for the purpose set forth.

3. In combination with a voting-machine, comprising a rotary shaft, disks mounted thereon and carrying sets of counting-wheels, a motor for imparting a single revolution to said shaft, means for automatically winding up said motor, means for automatically stopping said shaft at intervals, and a latch controlled by the voter for disengaging said stopping means, substantially as described.

4. In a voting-machine the combination



with the main frame and with the main shaft carrying numbering-wheels, of a motor for rotating said shaft, a notched disk on said shaft, a latch for automatically engaging with the notches therein, and a second latch, controlled by the voter for disengaging the automatic latch, and for releasing said shaft, substantially as described.

5. In a voting-machine, the combination with the main frame of the main shaft having the disk B<sup>2</sup> provided with a series of notches, the latch E' adapted to engage said notches automatically and successively, and the latch E adapted also to engage said notches, and thereby to disengage said latch E, and means for rotating the shaft when said latch is disengaged, substantially as described.

6. In a voting-machine, and in combination, a rotary main shaft, voting-disks carried thereby, sets of counting-wheels carried by said disks, a push-button for operating each set of counting-wheels and having a stem connected to the shaft upon which such set of wheels is mounted, a series of sliding tubes mounted in the voting-disks longitudinally slotted to receive the stems of all the push-buttons in the same horizontal plane, and oppositely slotted at intervals, and a movable cam on the main frame for sliding such tubes successively whereby their short slots are brought opposite the stems of the line of push-buttons, substantially as described.

7. In a voting-machine and in combination, a main frame, rotary voting-disks, carrying counting-wheels and push-buttons, a series of sliding tubes mounted in the voting-disks and having oppositely-placed slots, springs for normally impelling said tubes in one direction, a cam on the main frame for successively impelling said tubes in the opposite direction as the disks revolve, a shaft journaled in the voting-disks and carrying a series of latches, and springs for causing said

latches to engage with the slots on one side of said tubes, and to lock said tubes in position for the push-buttons to be operated, substantially as described.

8. In a voting-machine, the combination with the rotary voting mechanism, and with a hinged platform, of a stud on the voting mechanism, a catch arranged relatively to said stud, so as to engage with said stud at the end of each revolution, an arm connected to said platform, and adapted to engage with said catch, means for disengaging said arm from said catch, and springs for restoring and holding said catch and said arm in normal position for reengagement, substantially as described.

9. In a voting-machine, the combination with the revolving voting-disks carrying sets of counting-wheels, and operating-buttons, and with means for operating, locking and releasing said buttons, of a recording-strip, normally inactive, an inking device, and means for gearing said recording-strip to the said revolving mechanism whereby the totals indicated by said counting-wheels, will be recorded upon said strip, substantially as described.

10. In a voting-machine, the combination with a main shaft, of voting-disks arranged in pairs upon said shaft, sets of counting-wheels carried by each pair, a button for operating each set of wheels, means for turning said shaft, means for automatically stopping it, to permit each button to be operated, and means for operating, locking and releasing said buttons, substantially as described.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 24th day of February, 1897.

JOHN E. CHAPIN.

Witnesses:

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H. J. LANG.