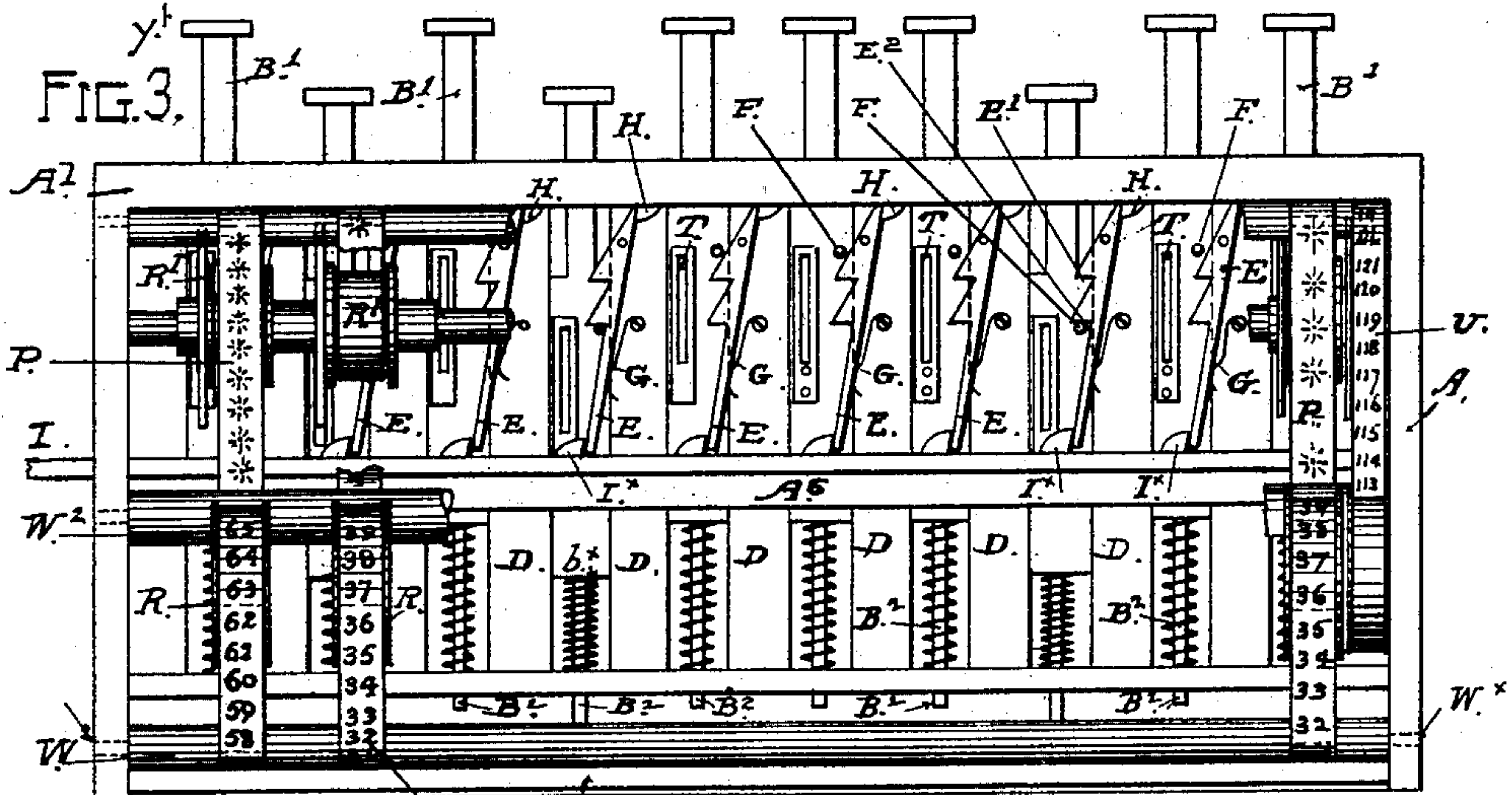
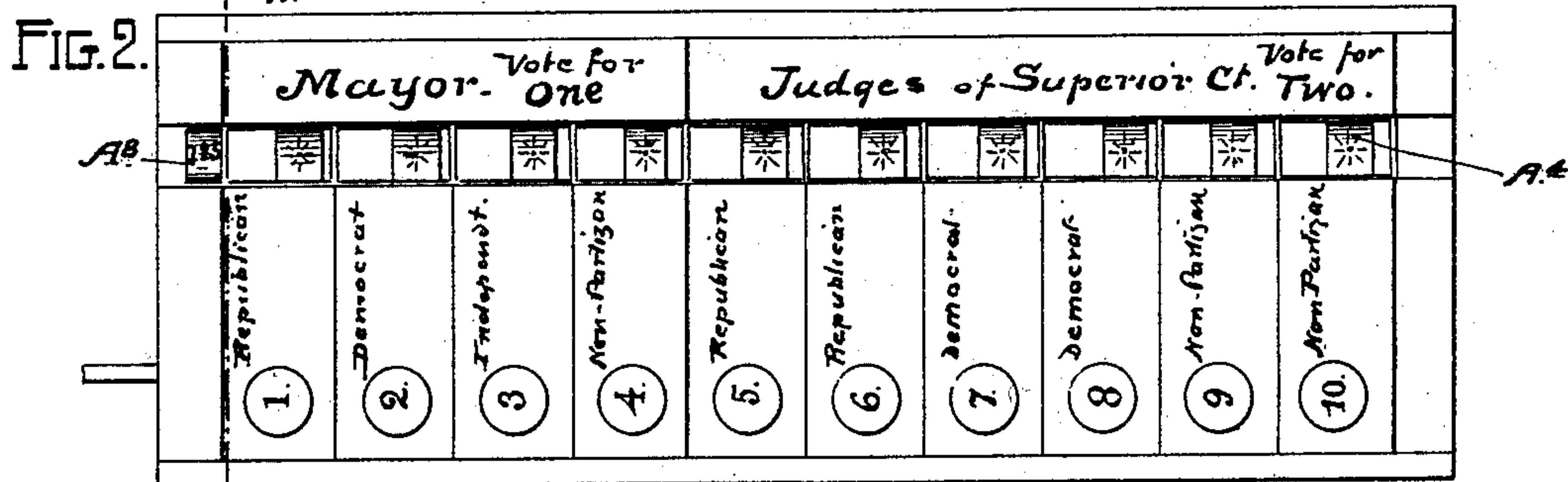
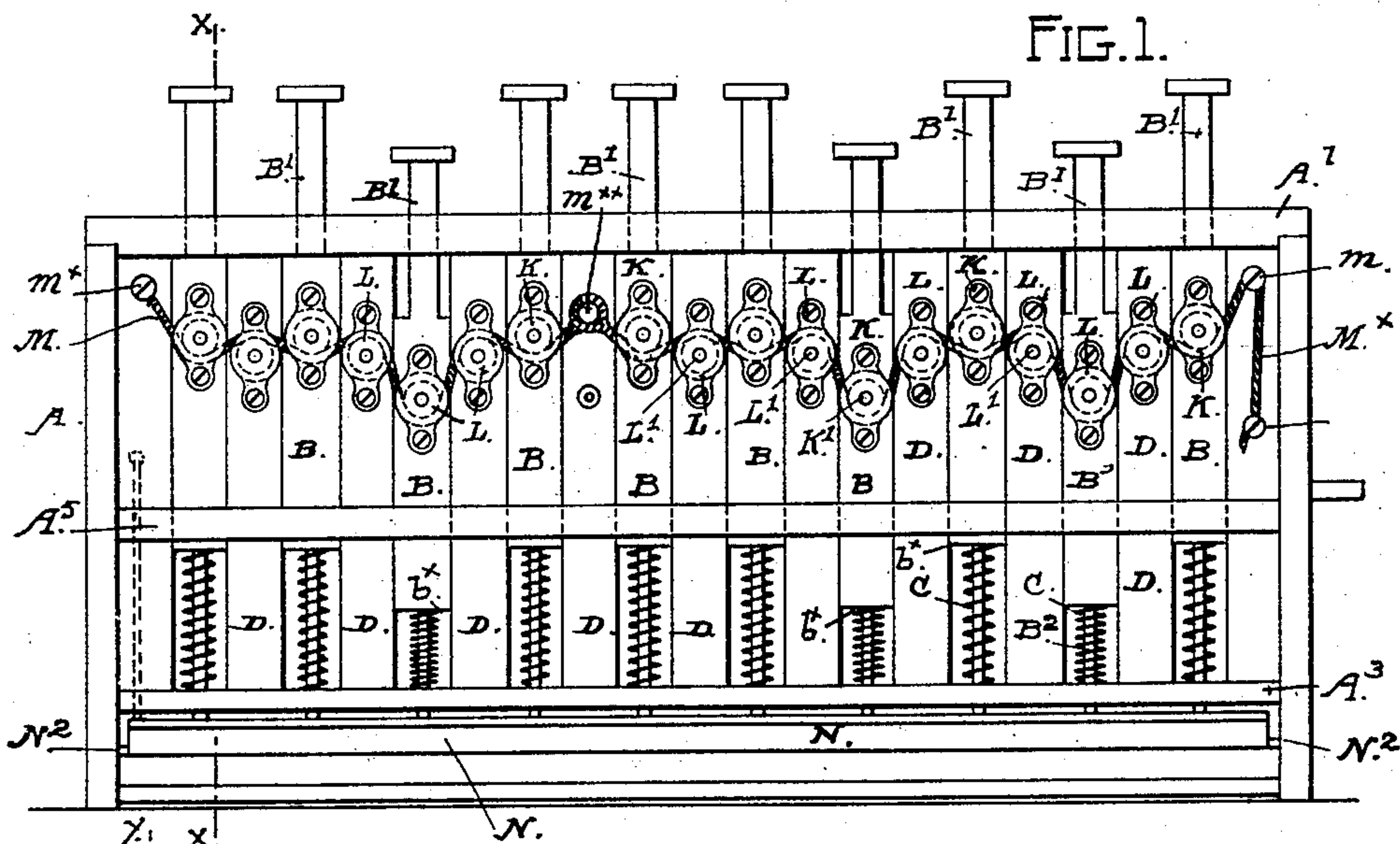


C. CHRISTENSEN.
VOTING MACHINE.

No. 550,016.

Patented Nov. 19, 1895.



WITNESSES
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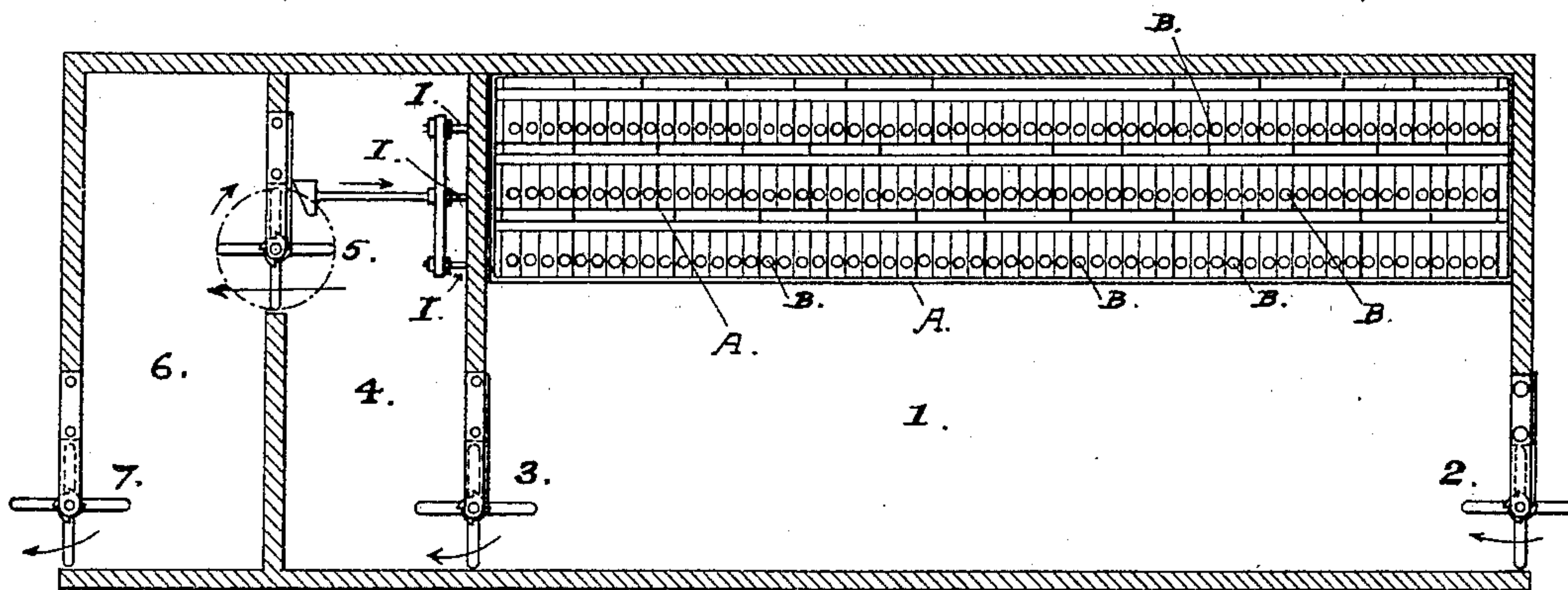
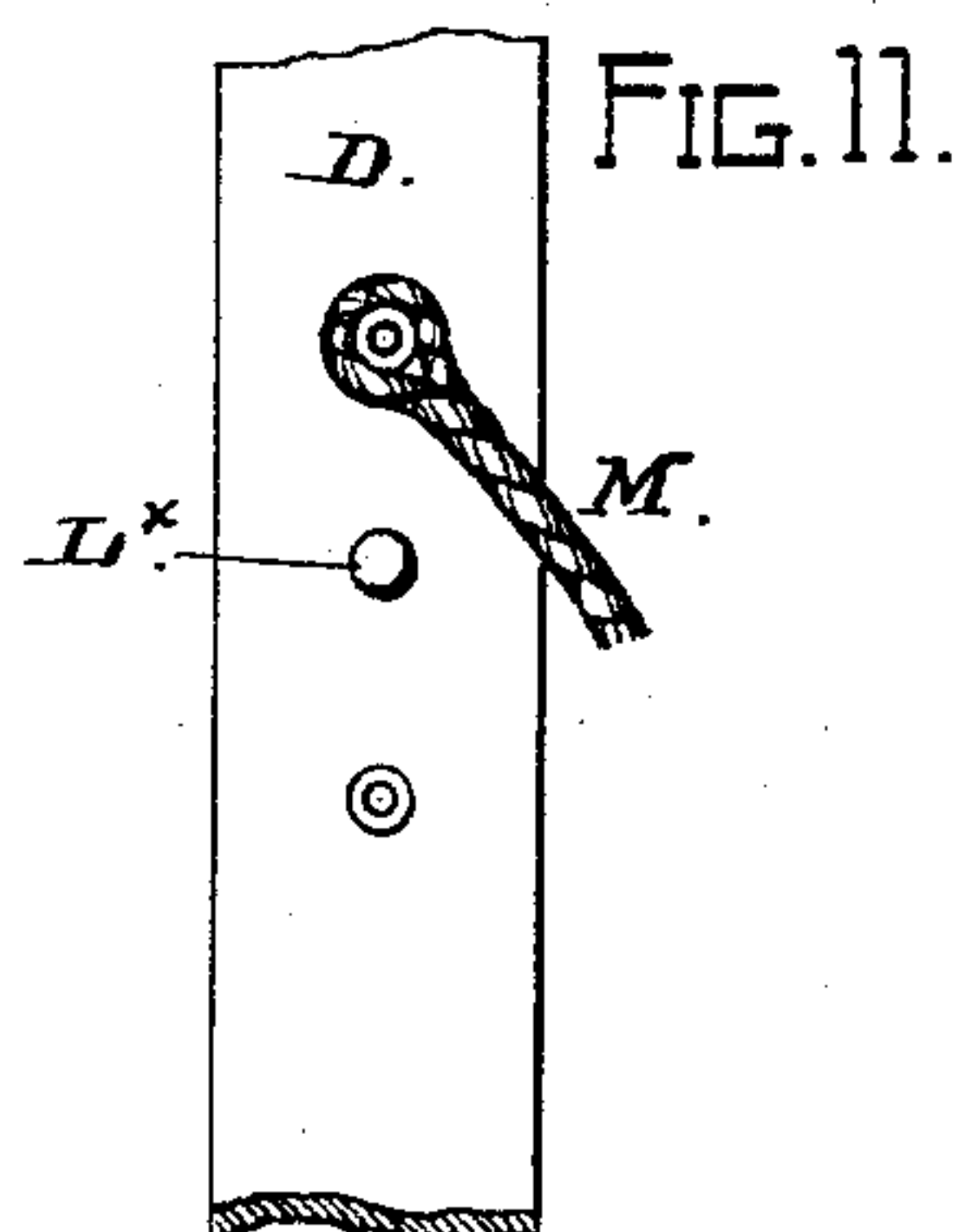
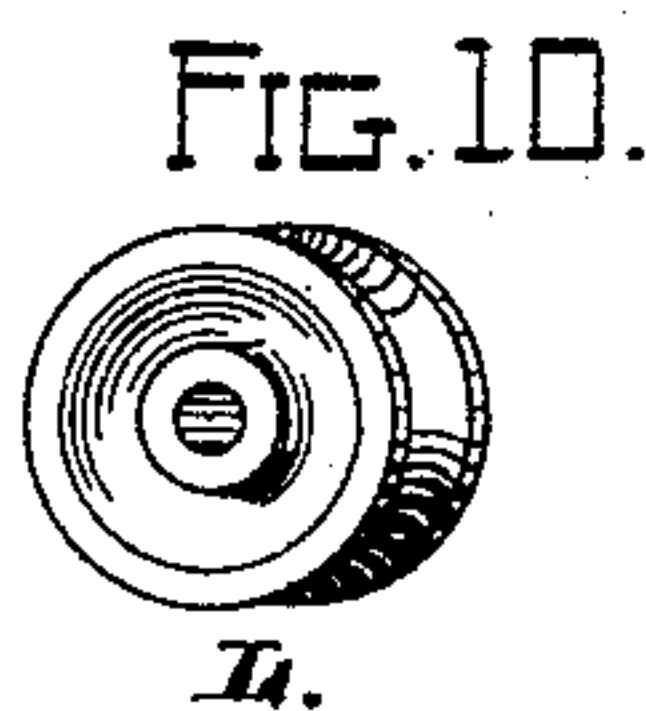
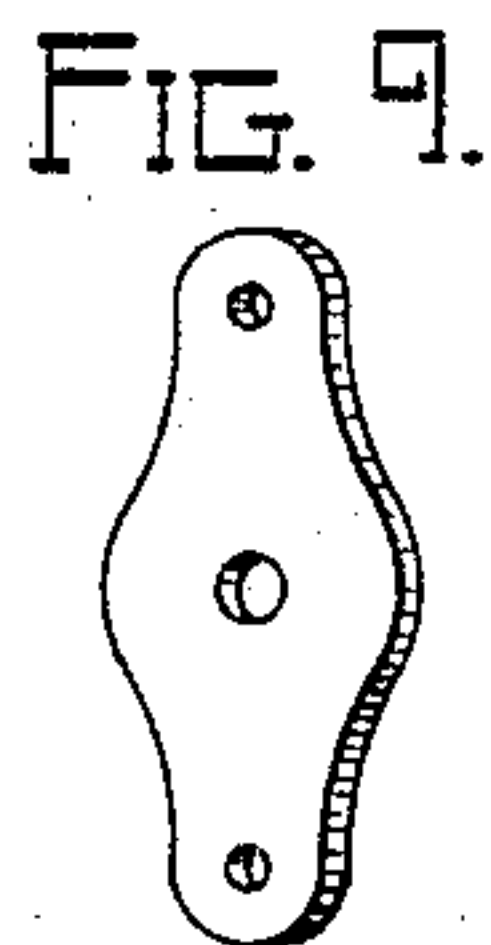
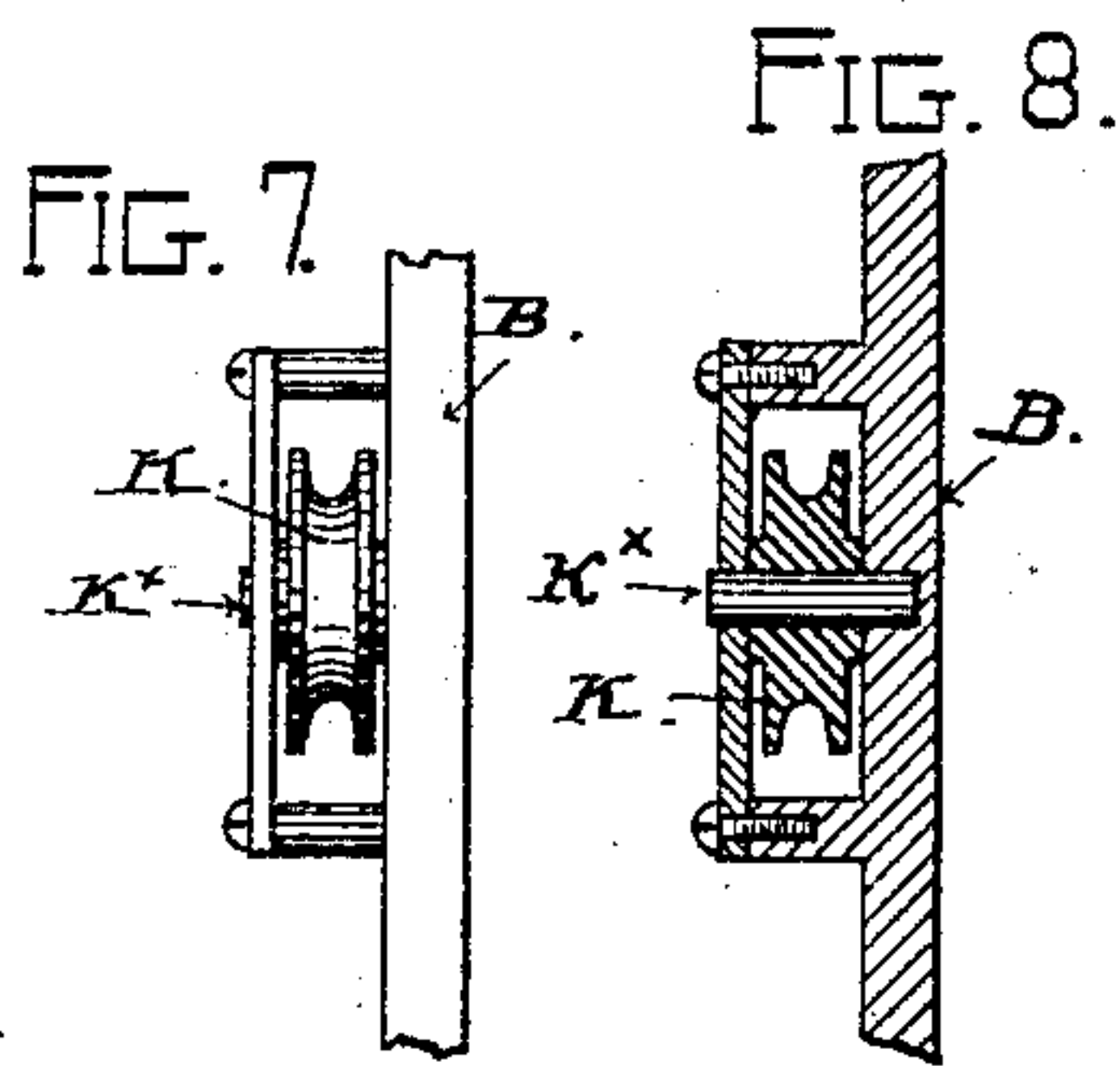
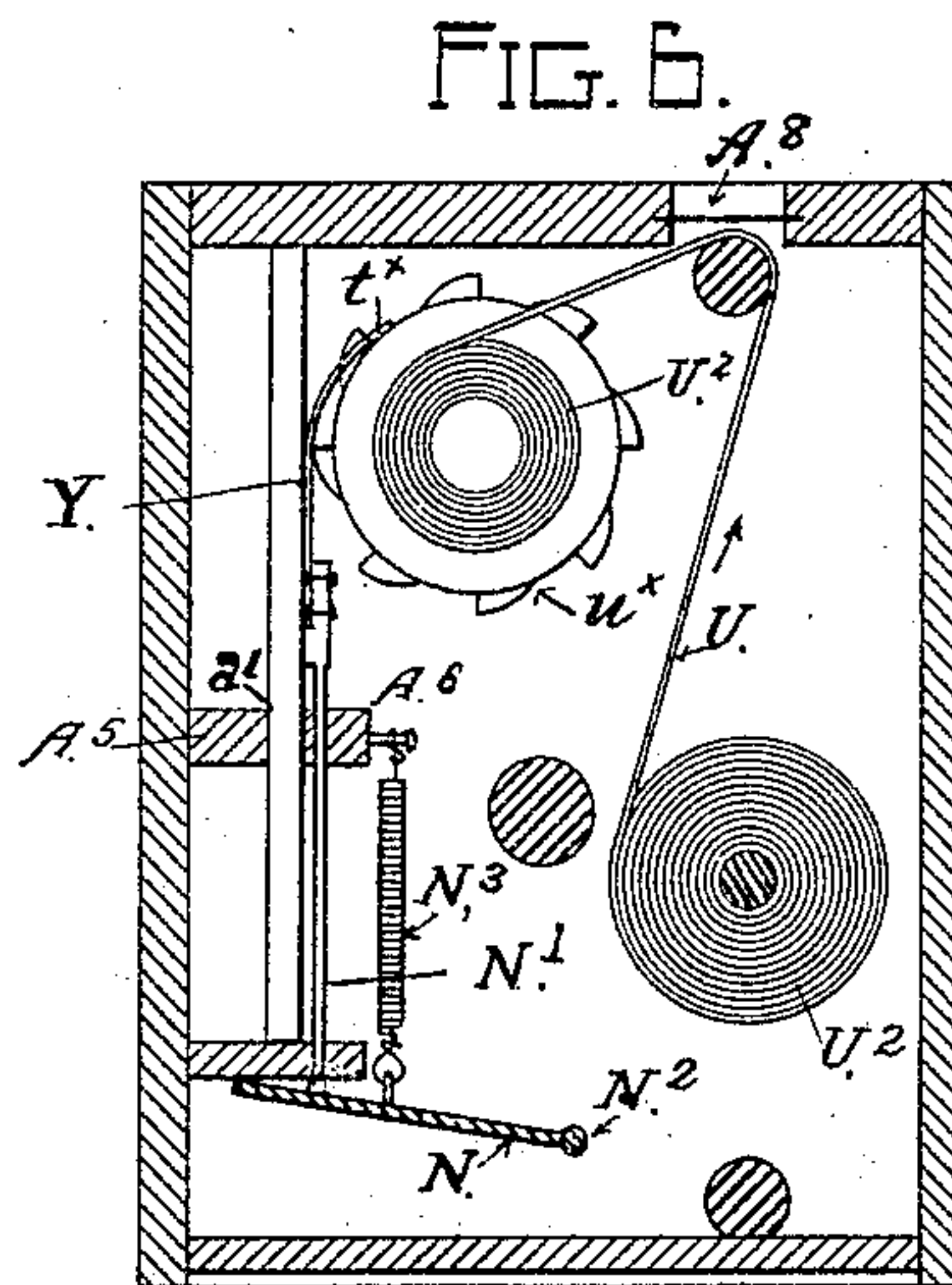
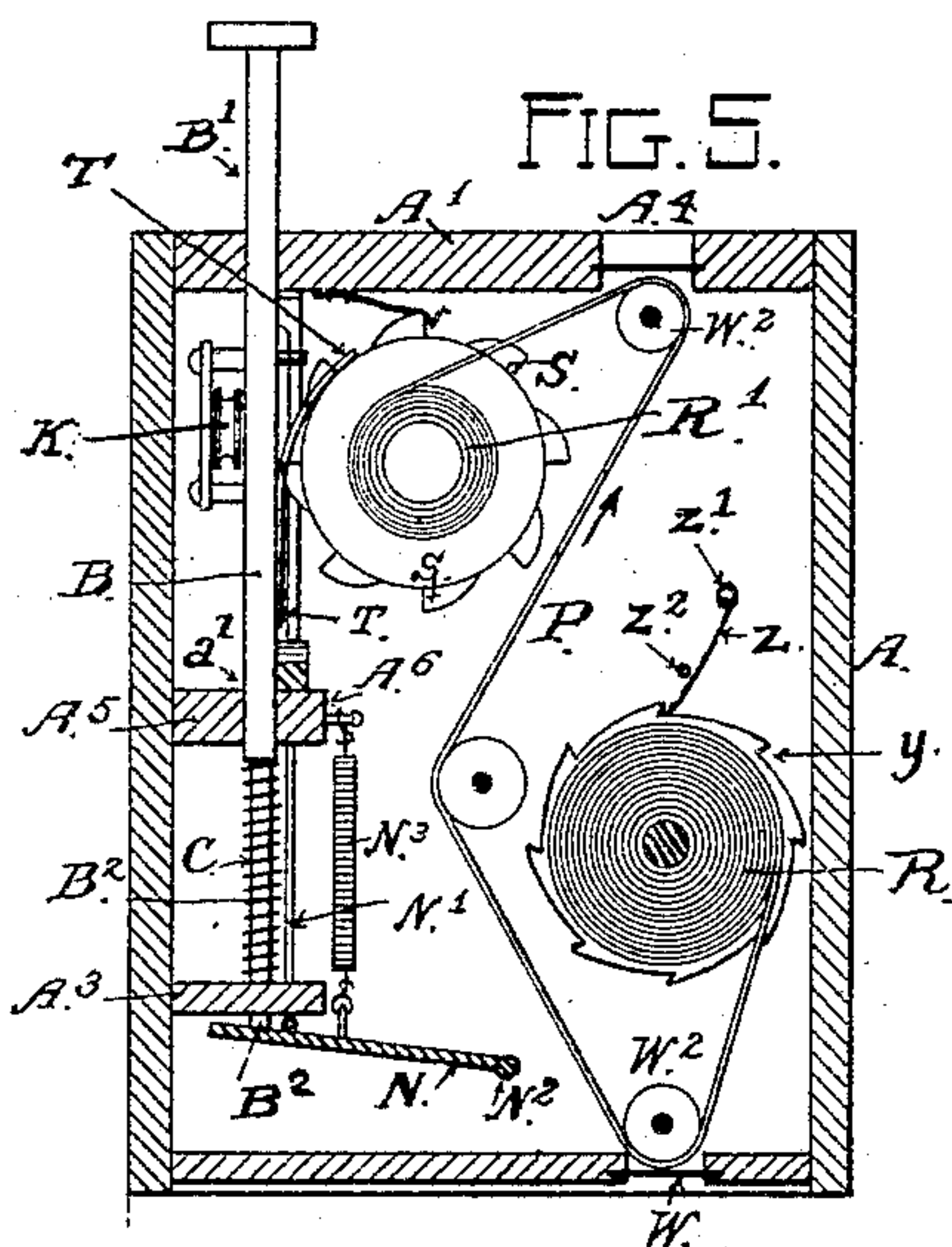


FIG. 4.



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UNITED STATES PATENT OFFICE.

CHRISTEN CHRISTENSEN, OF OAKLAND, CALIFORNIA.

VOTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 550,016, dated November 19, 1895.

Application filed January 29, 1895. Serial No. 536,579. (No model.)

To all whom it may concern:

Be it known that I, CHRISTEN CHRISTENSEN, a citizen of the United States, residing in Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Voting-Machines, of which the following is a specification.

These improvements relate to voting-machines of that class or description in which the candidates to be voted for are represented by individual keys and a register tape or band of indefinite length carried by two spools, each key being so connected with one of its spools by suitable mechanism that at each stroke or depression of the key the tape is drawn from one spool and wound on the other the proper distance to bring the numbers into position at a sight-opening in the box inclosing the mechanism. In these machines it frequently is required to limit the number of keys that may be operated by the voter—as, for example, where two or more candidates out of a considerable number standing for the same office are to be voted for—so that some means to prevent a voter, either accidentally or by design, from operating more than the proper number of voting-keys must be provided.

One part or feature of my present invention relates to novel means of controlling all the voting-keys that belong to any set of candidates standing for the same office, whereby the number of keys to be operated out of the whole number or set are so controlled and limited that after the keys to the proper number have been selected and operated by the voter all the remaining keys in the set are locked and cannot be operated. In addition to this mechanism for controlling the number of keys to be operated out of any set or series of keys, my invention embraces certain novel construction and combination of locking and releasing mechanism for the purpose of preventing irregularity or fraud in operating the machine on the part of the voter.

The following description explains more particularly the nature and construction of the said improvements and the manner in which the same are combined with other parts, producing a voting-machine whose practical features are great simplicity, cheapness of manufacture, and certainty in operation.

The accompanying drawings, forming part

of this specification, are herein referred to by figures and letters.

Figure 1 is a rear elevation of the machine, with the back panel removed for the purpose of exposing to view the parts inside the case. Fig. 2 is a plan or top view. Fig. 3 is a front elevation with the front panel taken off. Fig. 4 represents the plan of a voting-booth constructed with a separate entrance and exit and a voting-compartment in which the voting-machines are set up for use. Fig. 5 is a vertical cross-section through the machine on the left-hand side of the section-line $x x$, Fig. 1. Fig. 6 is a similar section taken on the left-hand side of the line $y y$, Fig. 2. Figs. 7, 8, 9, 10, and 11 are details on an enlarged scale of the parts of the key-controlling mechanism.

A indicates a box or case inclosing all the parts, and A' is a top plate through which work the voting-keys $B B$. These last-named parts are formed of rectangular bars or rods, each one with an upper portion B' of reduced width working through a slot in the top A^2 , and a stem or reduced portion B^2 at the bottom working in a fixed guide A^3 .

C is a spring on this stem bearing against the shoulder where the stem joins the broad flat portion of the key and holding up the key into position for action as well as to return it to position after it is depressed and released. The foot of the stem sets through the fixed guide-rail A^3 in the lower part of the case.

D D are upright stationary bars between the keys, for which they form guides, and having the same thickness as the broad portion or body of the keys. In addition to these bars horizontal strips $A^5 A^6$ are fixed across the front and the back of the guide-bars from one side to the other of the case just above the line of the shoulders b^x , principally to prevent the bars from springing out of line if they are made of wood. This construction is designed to leave both the front and back face of the broad portion of the key exposed or uncovered.

E E are locking-levers pivoted at the upper ends on the fronts of the fixed bars D and setting partly over and across the keys, one lever being arranged for each key; and $E' E^2$ are two notches or teeth on the side of each lever next to the key it controls and in line

with a pin F on the front face of the key. This pin F is set in such working relation to the notched side of the lever that as the key is pressed down the pin rides against the standing edge of the tooth and presses back the lever until it reaches and passes off the point of the tooth, when the lever moves back to position, catching the pin F under the shoulder.

G is a spring fixed at one end to the stationary bar D, and acting against the back of the lever below its pivot. H is a stop on the same bar controlling this return movement and determining the position of the lever when at rest.

The lower notch or tooth is so situated that it catches and locks the key at the time it reaches the end of a full stroke, and the upper notch is arranged to prevent the key from being partially depressed and then raised for another stroke, which irregular action or operation might otherwise be carried out either by carelessness or design, and so the key be made to operate the recording-tapes at both movements.

I is a bar sliding on the fixed rail A⁶ and under the ends of the levers E and projecting at one end through the case A. I^x I^x are fixed lugs or projections on the top face of this bar standing in line with and in such close relation to the lower ends of the levers E that by the one movement of the bar I the whole set or number of levers will be pressed back simultaneously, thereby releasing all the depressed keys and allowing them to return to position.

The bar I is brought through the side of the case at one end and is operated in one direction by pressing on that end, but it is moved back again or in the contrary direction by the combined pressure of all the levers E acting against the stops I^x. These parts constitute the mechanism for locking and releasing the keys.

K K are grooved pulleys loosely set for rotation on studs K^x, fixed in the rear faces of the stationary bars between the keys, and L L are similar pulleys mounted in like manner on the back faces of the keys on studs L^x.

M is a cord or wire attached at the ends to fixed points on the stationary bars and passing alternately under a pulley on a stationary bar and over the pulley on the next key through the whole set or series of keys E. By a single cord carried in this manner all the keys included in one set are connected together, and the movement of any desired number of keys in the set is permitted by providing suitable slack or excess in the length of the cord.

In the construction illustrated in the drawings the keys are arranged for operation in two separate sets, one of which consists of the first four keys, counting from the left-hand side of Fig. 1, and the other of the remaining six keys. The cord M, attached at one end to the fixed point m^x and at the other

end to the fixed point m^{xx} , ties together all the keys between those two points and has sufficient slack to allow one key in the set to be pressed down, and consequently the excess in the length of the cord beyond the quantity required to pass over and under all the pulleys in the set is so regulated that it will be taken up by the full stroke of one key and the cord will then be drawn taut between the two fixed points. This prevents any additional key of the same set from being pressed down, and consequently all the remaining keys are thrown out of action when one is depressed. The operation is the same in the next set of keys, in which, however, their controlling-cord M^x has sufficient amount of slack to allow vertical movement of any two of the six keys composing that set. This cord M^x is attached to the fixed points m^{xx} and m . This manner of arranging and tying the keys together in sets is capable of extension to permit any required number of keys out of a set to be operated and to hold the remaining keys out of action as soon as the proper number has been pressed down by the voter.

A greater or less number of keys are arranged for operation in one machine as the number of offices and the number of candidates for each office may be found to require, and the construction is capable of extension to embrace a considerable number of offices in one machine or of division to include a few offices and candidates in one box, in which case as many separate boxes are provided as the number of offices to be voted for at the same election may demand.

The register mechanism for each key is operated by the single downward movement of the key, and it consists of a tape or band P, of indefinite length for each key, wound on a spool R and from this spool drawn off and wound on a second spool R' by the operation of a ratchet-wheel S on the last-named spool and a pawl T on the key. The pawl is fastened to the front face of the key at the lower end and sets over the edge of the ratchet-wheel to engage one tooth at each movement of the key. The register-numbers are printed on one face and the tape is properly guided by rollers to show at a sight-opening W in the bottom of the case. W² W² are rollers loosely mounted on axles W^x across the case to guide and carry the tapes from the spool R downward to this sight-opening and then upward to the spools R', and in close relation, also, to a sight-opening A⁴ in the top of the case. That side of the tape which is exposed to view at the opening in the bottom of the case bears the numerals from 1 upward, increasing in arithmetical order, and as each tape is moved by the strokes of the key connected with it by the ratchet-wheel and pawl, as before described, it registers at the lower opening as often as its key is pressed. The reverse side of the tape P is not numbered, but is exposed to view at the sight-opening A⁴ in the top of

the case, in order that a person operating the keys may see that the tapes are moving and the machine is working properly when the keys are pressed down. This reverse side of the tape may have ornamental characters or marks of some kind at intervals apart to show the movements more plainly.

Fig. 6 illustrates mechanism for operating a register-tape to show the total vote. This tape U is laid on two spools U^2 U^2 , and is drawn from the lower spool and wound on the upper spool by a pawl-and-ratchet mechanism t^x u^x . The bar Y slides in bearings at a' and has a pawl t^x on the front face engaging the teeth of the ratchet-wheel that turns the upper spool the distance of one tooth at each stroke. The movement of this bar takes place at each operation of the machine, and is produced by the first moved key on the keyboard acting at the downward stroke upon a hinged plate N, to which the slide-bar Y is connected by a rigid rod N'. The plate N is hinged at N² at the ends of the case and the opposite movable side sets directly under the lower ends B² of all the key-bars. A spring N³, attached to the hinged plate at n^4 and to a fixed point on the stationary-bar A⁶ above, holds up this plate in close contact with the ends of the key-bars. The movement of any one of the keys will press down the plate N, thereby actuating the slide-bar Y, drawing it down, and causing its pawl t^x to turn the ratchet-wheel of the spool U^2 the distance of one tooth. The tape U, registering the total vote, is moved by this means the distance of one number at the sight-opening A⁸ for every voter. When the voting-keys are released, after the voter has left the machine, the springs N³ bring up the plate N as the keys rise, and it remains in position for the next voting operation.

The tape U is exposed to view at the opening A⁸ in the top of the case and bears the registering-numbers on that face which is turned upward.

All the openings in the case, and also the table containing the names of the candidates, should be protected by a glass cover framed into the top of the case.

The register-tape on the spools R R' is drawn off one spool and wound on the other spool at every full stroke of the individual key connected with the spools, and to prevent the tape from being moved the required distance by a movement of the key less than the full length of its stroke the following means is employed: The rim of the lower spool R is notched at y y , corresponding in number with the number of notches S in the upper spool R', and a stiff spring-tongue Z, fixed at the upper end to the stationary-rod Z', is set to bear at its free end against the spool R and engage the notches y . Thus when the spool is turned the spring will yield and disengage from the notch as the spool reaches the end of the rotative movement which the full stroke of the key will produce, after which the end of the spring leaving the notch flies back and engages the next

notch; but if such stroke of the key made is less than a full stroke the spring, still retaining its hold in the notch of the spool R, will act to draw the spool back again when the pressure of the key is released at the end of the short or partial stroke, and consequently the spool R will be brought back to the starting-point again whenever a partial or imperfect stroke has been given to the voting-key, and the register-tape is caused to start always from the proper position to bring the following numeral into register and is prevented from moving the distance from one number to the next by the tape, unless the full stroke is imparted to the key. The return movement of the spring when its end leaves the notch in the spool-rim is controlled by a fixed stop Z².

Fig. 4 illustrates an arrangement of a number of machines in a voting-booth with mechanism so connecting the releasing-bars I with an exit-gate or turnstile that each voter in passing out of the voting-room mechanically throws off the locking-levers of all the keys in the whole number of boxes or machines and sets them ready for the next voter.

1 represents the voting-room, 2 the entrance-turnstile, and 3 an exit leading into another compartment 4. Through a turnstile 5 the voter passes into an outer compartment 6, and thence obtains exit to the outside. All these turnstiles operate in one direction only.

The releasing-bars I of all the voting-boxes in the room 1 are brought through the partition between the compartments 1 and 4 and are connected together by a cross-head V, from which a rigid rod V' is carried forward to set in the path of the arms of the turnstile 5. A head V², with an inclined face presented to the ends of the arms, is fixed on the end of the rod to receive the contact of the arms as the turnstile is moved in the direction of the arrow, so that as each voter passes through the arm of the turnstile next to the incline V² presses back the rod V and pushes in all the releasing-bars.

It will be evident that the voting boxes or machines can be set in position against the vertical wall, so that the keys will stand out horizontally, instead of placing them in the position shown in Fig. 4, where the keys stand vertically.

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

1. In a voting-machine, the combination with the slide-bars B, stationary guide-bars D D and springs C; of the tape-carrying spools R R', guide rollers W², ratchets S, and pawls T, the teeth Y and the spring tongue Z engaging said teeth and having limited movement in one direction as described, to operate as set forth.

2. In a voting-machine, the combination of the slide-bars B, stationary guide-bars D D, springs C, hinged-plate N, slide-bar Y, pawl t^x , connecting rod N' and spring N³,

with the spools U^2 U^2 carrying a registering-tape and the ratchet u^x .

3. In a voting-machine, the combination
5 with the voting-keys B B, springs C and fixed
guides D D, of the pulleys K on the keys, the
pulleys L on the fixed guides, and the separate
cords M M^x attached at the ends to fixed
points and laid through said pulleys alternately
10 over one pulley and under the next
pulley and joining the said keys in two separate

sets, the length of each cord being proportioned as described to permit perpendicular movement of a given number of keys in the set, substantially as set forth.

In testimony that I claim the foregoing I 15
have hereunto set my hand and seal.

CHRISTEN CHRISTENSEN. [L. S.]

Witnesses:

EDWARD E. OSBORN,
C. W. M. SMITH.