

(No Model.)

R. RUHLMAN.
REGISTER FOR ENGINES OR MACHINES.

No. 432,441.

Patented July 15, 1890.

Fig: 1.

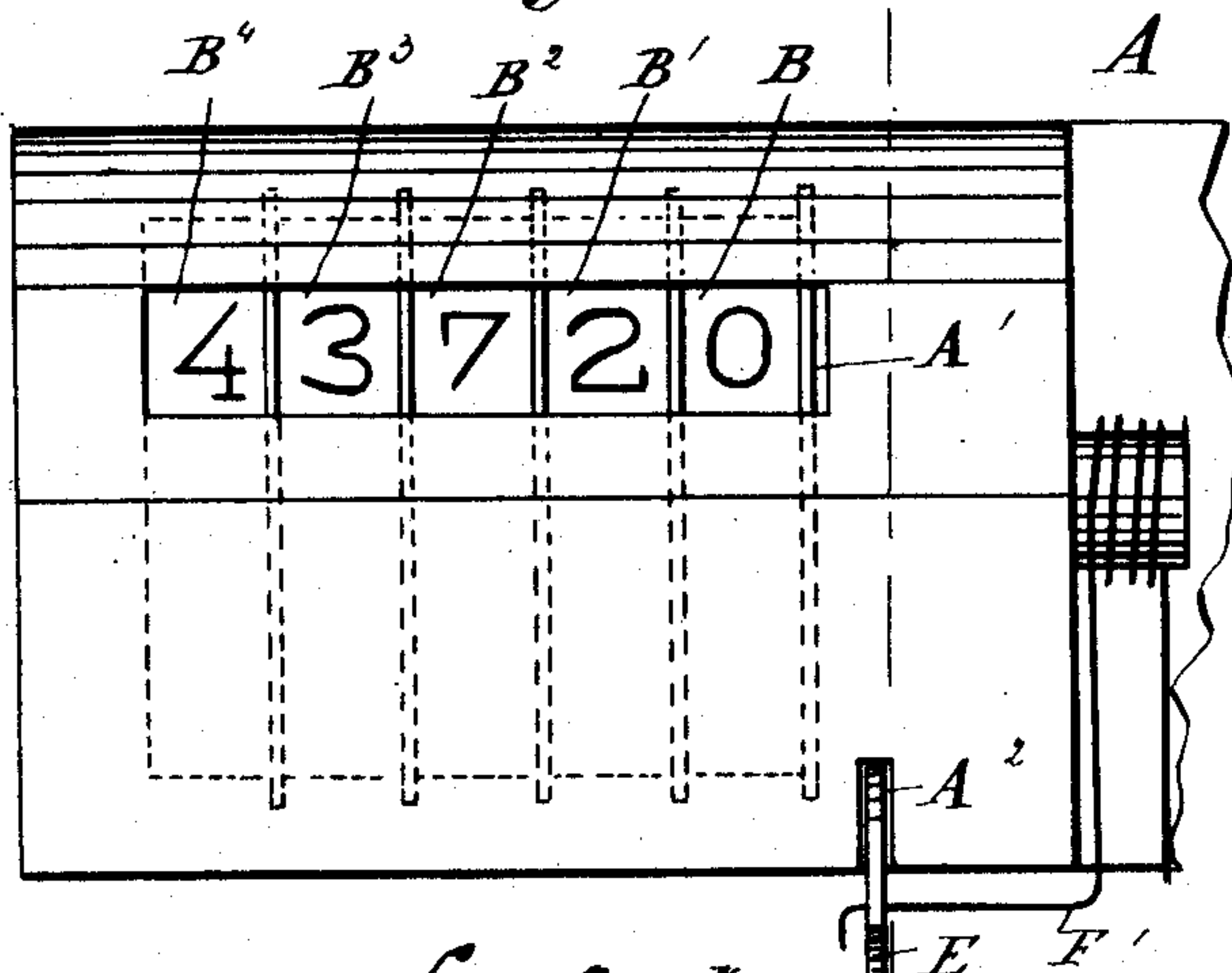


Fig: 2.

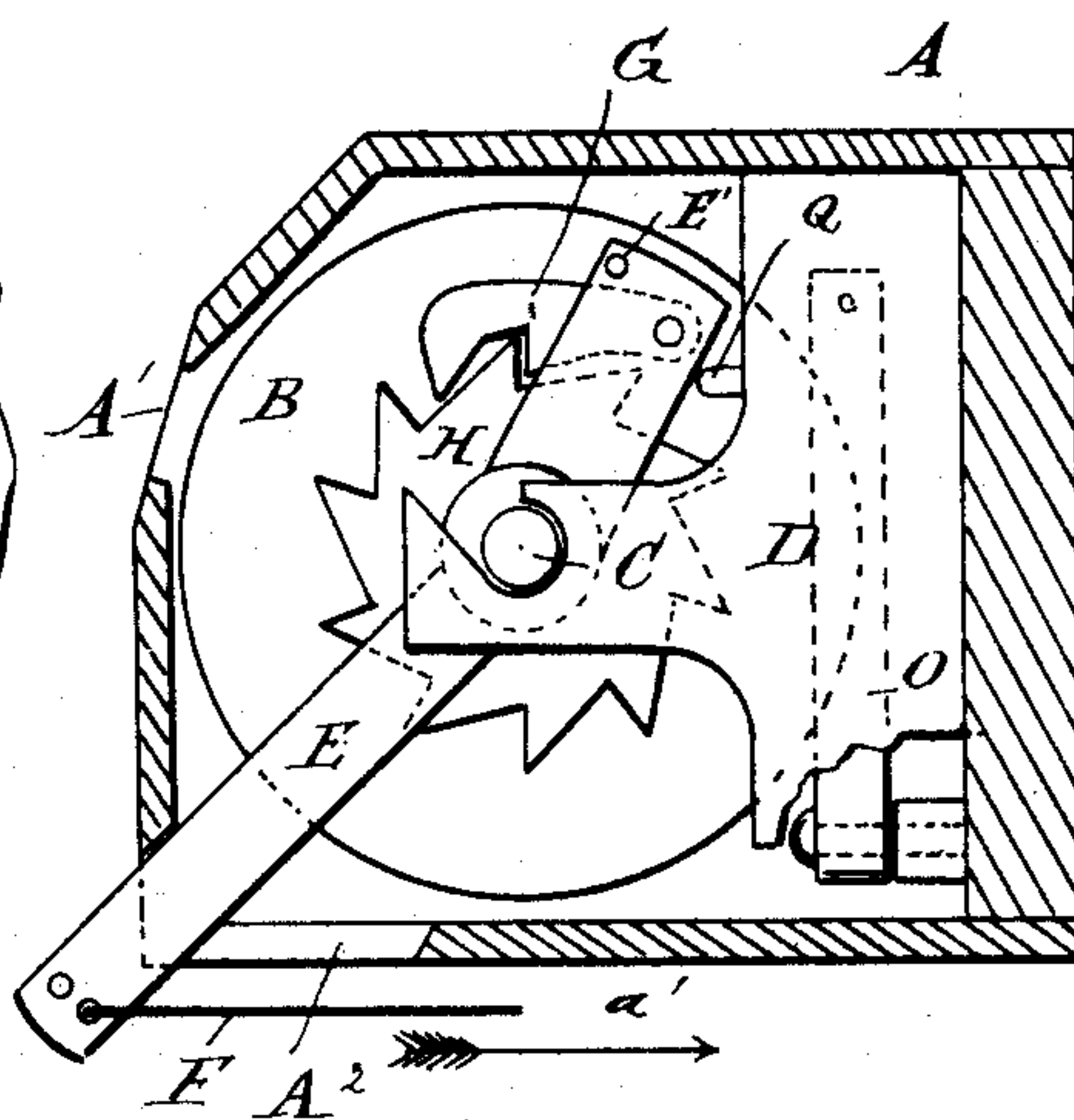


Fig: 3.

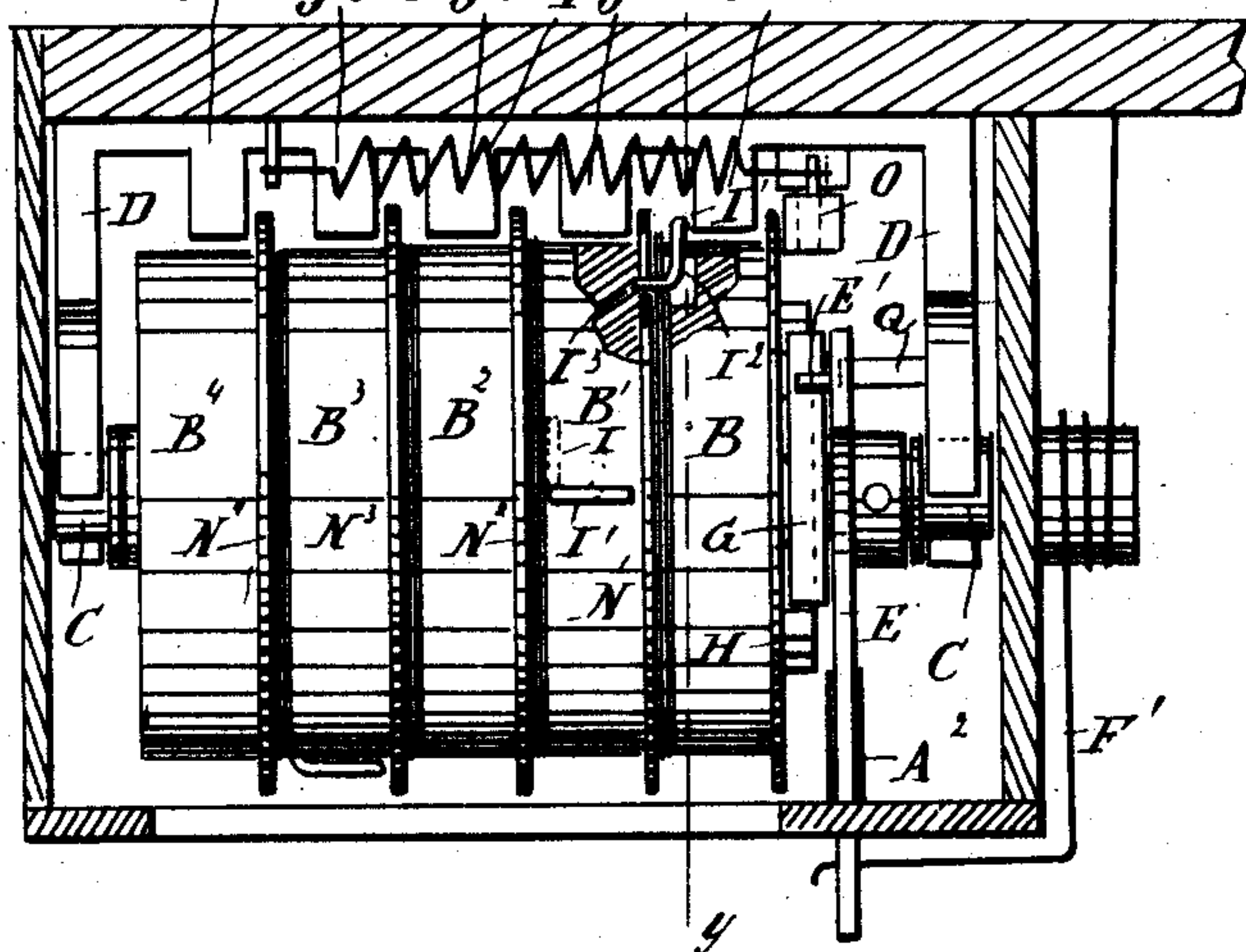


Fig: 4.

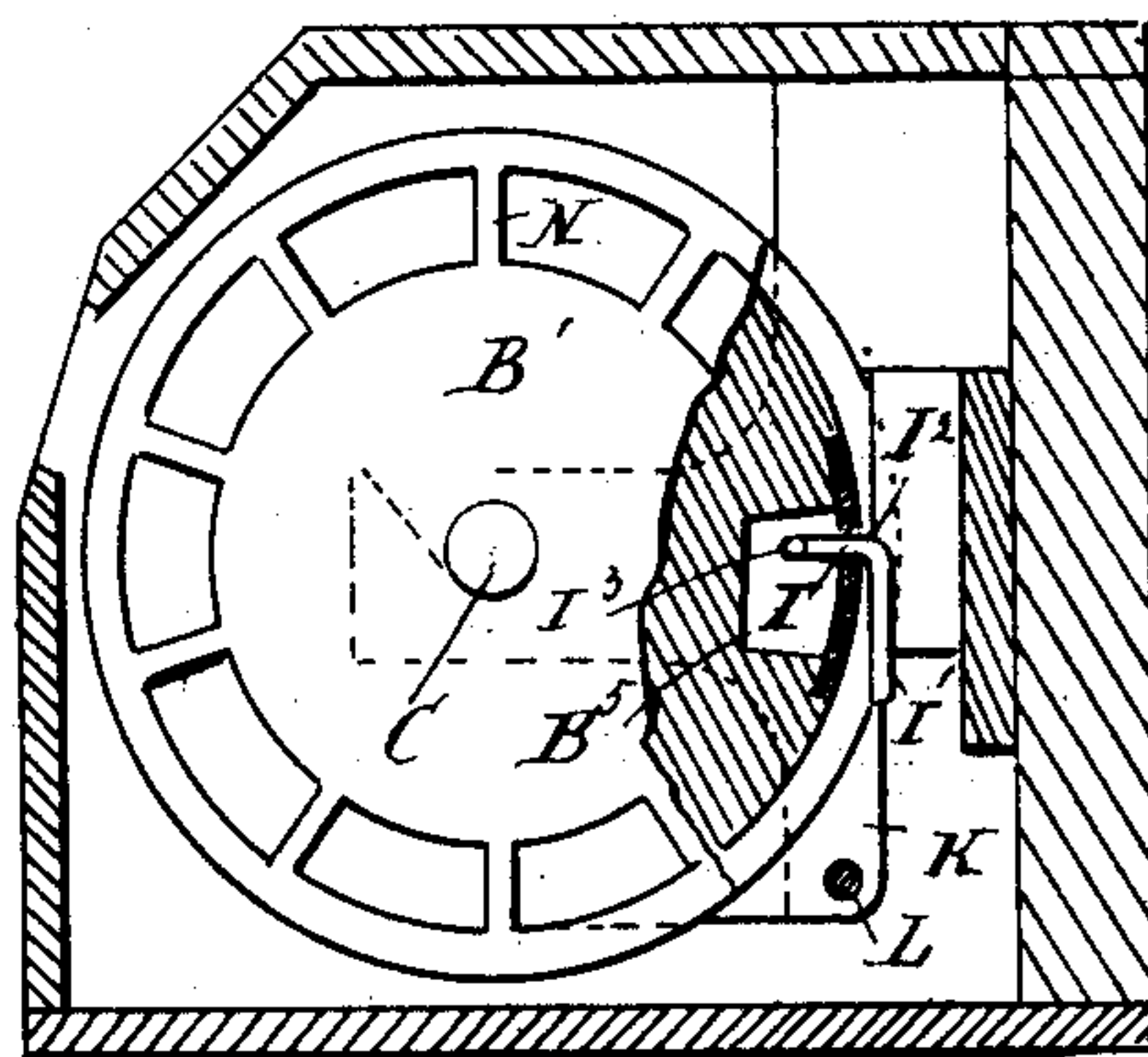


Fig: 5.

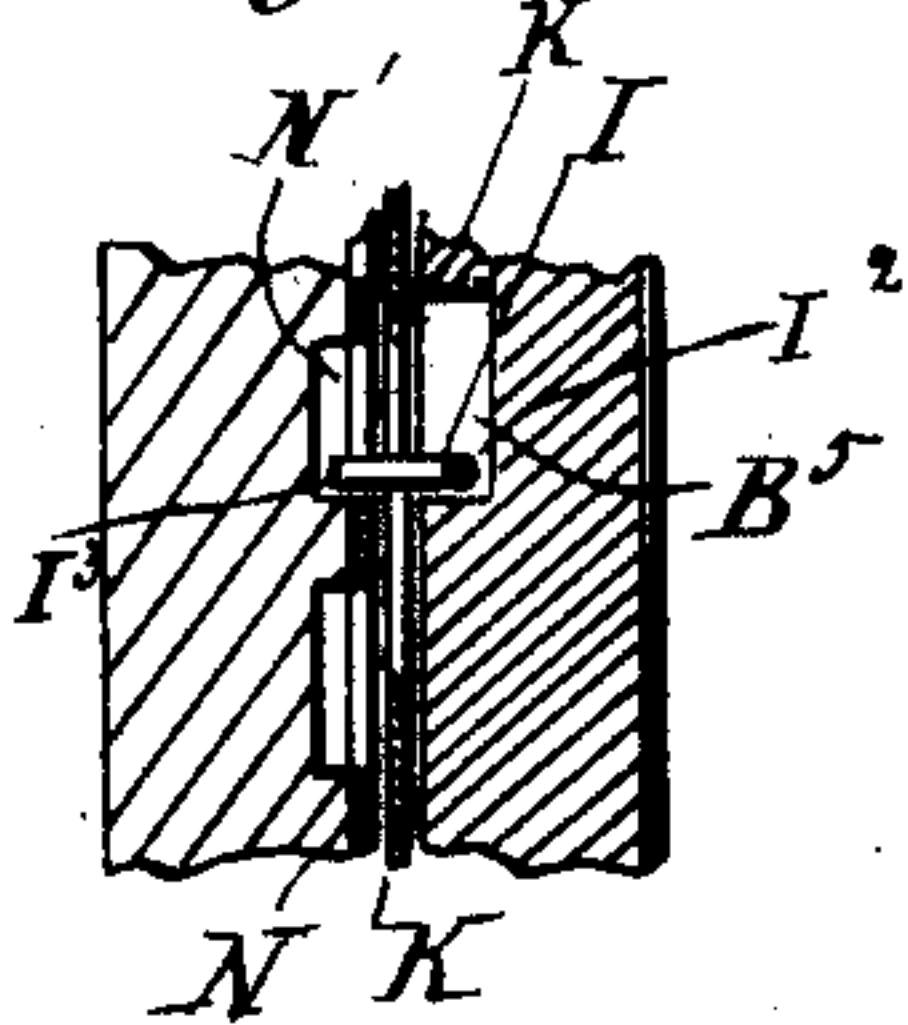


Fig: 7.

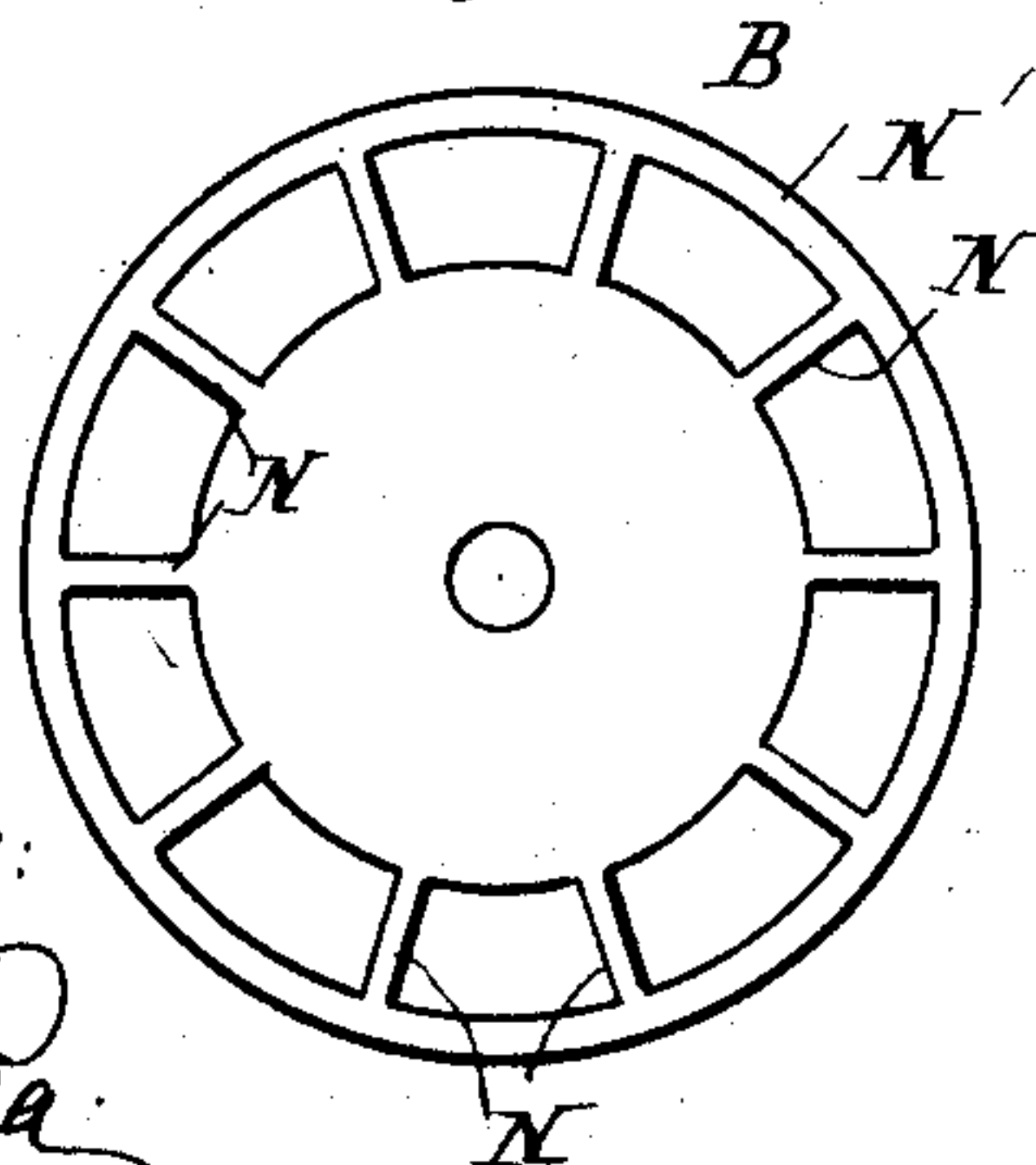


Fig: 8.

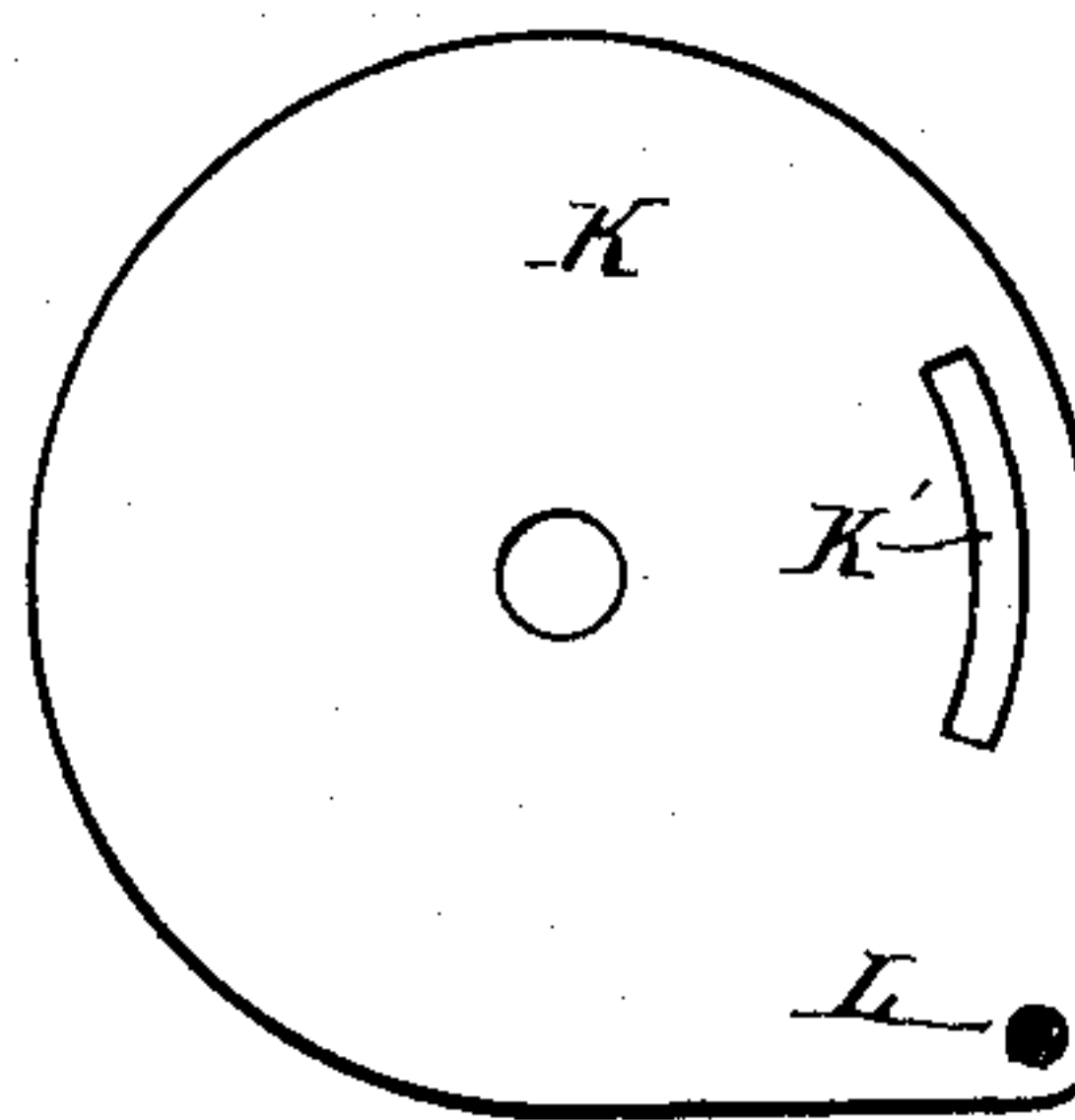
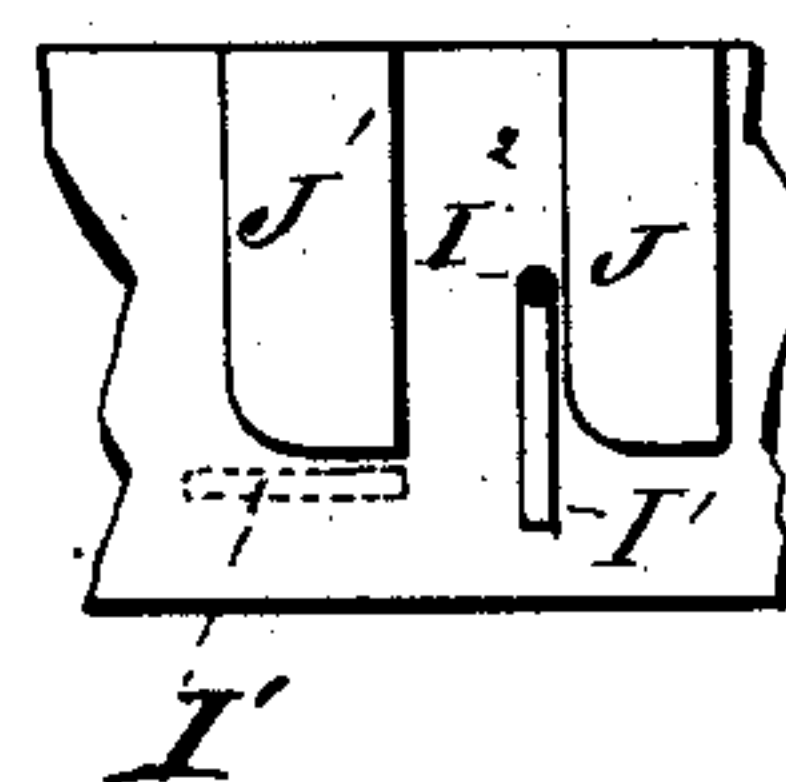


Fig: 6.



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RUDOLPH RUHLMAN, OF TRENTON, NEW JERSEY.

REGISTER FOR ENGINES OR MACHINES.

SPECIFICATION forming part of Letters Patent No. 432,441, dated July 15, 1890.

Application filed January 14, 1890. Serial No. 336,924. (No model.)

To all whom it may concern:

Be it known that I, RUDOLPH RUHLMAN, of Trenton, in the county of Mercer and State of New Jersey, have invented a new and Improved Register for Engines or Machines, of which the following is a full, clear, and exact description.

The invention relates to registers or counters for registering revolutions or definite motions made by steam-engines, printing-presses, or other machinery.

The object of the invention is to provide a new and improved register which is simple and durable in construction, very effective in operation, and has its counting or numbering wheels actuated by direct mechanical movement without the use or aid of springs.

The invention consists of certain parts and details and combinations of the same, as will be hereinafter more fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front view of the improvement. Fig. 2 is a transverse section of the same on the line $x x$ of Fig. 1. Fig. 3 is a top view of the improvement with the casing and parts in section. Fig. 4 is a transverse section of the same on the line $y y$ of Fig. 3. Fig. 5 is a sectional plan view of part of the improvement, showing the lever engaging two numbering-wheels. Fig. 6 is a face view of the cam for actuating the levers. Fig. 7 is a face view of one of the numbering-wheels, and Fig. 8 is a face view of the stationary plate for operating the lever in order to throw it out of contact with the next numbering-wheel.

The improved register is provided with a suitably-constructed casing A, having in its front a longitudinally-extending opening A', through which appear the numerals of the several numbering-wheels B, B', B², B³, and B⁴, of which the numbering-wheel B is the units-wheel, B' the tens-wheel, B² the hundreds-wheel, B³ the thousands-wheel, B⁴ the tens-of-thousands wheel. The several numbering-wheels, of which there may be any desired number, are mounted to turn loosely on a fixed shaft C, secured in suitable brackets

D, fastened inside of the casing to the back of the same. On the end of the shaft C, next to the units-wheel B, is mounted to swing loosely a lever E, extending with its lower end through a transverse slot A² in the casing A, and connected at its outer end by a rope F or other suitable device with the machine, the revolutions or motions of which are to be counted.

The machine imparts motion to the lever E in the direction of the arrow a' , indicated in Fig. 2, and the return-motion can be made by a spring F', secured on the casing A and pressing on the free end of the lever E, as indicated in Figs. 1 and 3. The return movement may also be made directly from the machine, the motions of which are to be counted, or by counterbalancing the lever E by a weight.

The upper end of the lever E carries a pawl G, preferably provided with double teeth, as indicated in Fig. 2, so as to firmly grasp one of the teeth of a ratchet-wheel H, secured to the outer face of the units-wheel B. The ratchet-wheel H is provided with ten teeth, and the stroke of the lever E is set so that when the lever E is on its forward stroke the ratchet-wheel H is moved the distance between two teeth, so that the successive numerals on the periphery of the units-wheel B appear through the opening A' in the casing A.

The pawl G is a gravity-pawl, and is prevented from disengaging the ratchet-wheel H by a pin E', held on the lever E and serving to limit the outwardly-swinging motion of the pawl G, when it glides backward over the teeth on the return-stroke.

Each of the numbering-wheels B, B', B², and B³ is provided with a lever I, composed of an arm I', extending on the outside of the periphery of the respective numbering-wheel and formed with the radially-extending part I², mounted to turn in the periphery of the numbering-wheel, as is plainly shown in Fig. 4, and on the inner end of this radial part I² is formed an arm I³, standing at right angles to the arm I' and free to turn in a recess B⁵, formed in the respective numbering-wheel. When the outer arm I' stands longitudinally across the face of the numbering-wheel B or B', then the inner arm I³ extends transversely

in the recess B⁵; but when the outer arm I' is given one quarter-turn then the inner end I³ is thrown into engagement with the next numbering-wheel, so as to move the latter in the manner hereinafter more fully described.

Ordinarily the arm I' of the lever I stands longitudinally across the periphery of its respective numbering-wheel; but when the latter is moved the said arm I' is engaged by a fixed lug or projection J, J', J², J³, or J⁴, respectively arranged in the rear of the respective numbering-wheels B, B', B², B³, or B⁴, so that the lever I is given one quarter-turn, and the other arm I³ is thrown into a longitudinal position, passing through a segmental slot K', formed in the fixed disks K, arranged between each two adjacent numbering-wheels and having their centers on the fixed shaft C, and held in place by a longitudinally-extending rod L, secured to the brackets D. At the same time the arm I³ passes against a radial arm N, formed on flanges N', N², N³, and N⁴, secured to the respective numbering-wheels B', B², B³, and B⁴. Each of the flanges N', N², N³, and N⁴ is provided with ten radial arms N, and the slot K' is of such a length that when the arm I³ has moved the following flange N', N², N³, or N⁴, respectively, the distance between two numerals on its wheel then the arm I' has left the respective lug J, J', J², J³, or J⁴, and the other arm I³ has reached the upper end of the segmental slot K', so that the arm I³ in striking against the upper end of the slot K' is turned back to its former position, and the arm I' again assumes its natural longitudinal position across the periphery of the respective numbering-wheel.

In order to prevent the units-wheel B from being moved too far by the motion of the pawl G, a friction-brake O is provided, which is fulcrumed in the casing A and rests with one side against the outer face of the numbering-wheel B, the upper end of the said friction-brake being connected with a spring P, which presses the said friction-brake tightly against the numbering-wheel B, so as to hold the latter in place, and to prevent the pawl G, by a rapid motion of the lever E, from moving the wheel B too far.

On one of the brackets D is arranged a stop-pin Q, to limit the movement of the lever E.

The operation is as follows: As shown in Fig. 1, the number "43,720" appears through the opening A' in the casing A. When the machine, the revolutions or motions of which are to be counted, is set in motion, then a forward and backward stroke is imparted to the lever E, which by its pawl G moves at every full stroke the ratchet-wheel H the distance between two teeth, so that at every stroke the numbering-wheel B causes the next following numeral to appear in the opening A'. When the numeral "9" of the numbering-wheel B appears in the opening A', then the arm I' of the lever I has already engaged the lug J, and has thrown arm I³ into close contact with the radial arm N of flange N', thus preparing it

for the next stroke. When the next stroke is now imparted to lever E, the wheel B is turned and carries along with it the second numbering-wheel B', so that the latter is moved until the next following numeral on its periphery appears in the opening A'. When this is accomplished, the arm I' of the lever I has left the upper end of the lug J, and at the same time the arm I³ strikes against the upper end of the slot K' in the next disk K, so that the said lever is turned back to its former position—that is, the arm I³ is disengaged from the respective radial arm N of the flange N', and also thrown out of the segmental slot K'. The other arm I' of the lever I then stands in a longitudinal position across the periphery of the numbering-wheel B, and remains so until it again comes in contact with the lug J, as previously described. When the tens-numbering wheel B' has been shifted until the numeral "9" appears in the opening A', then the arm I' of its lever I is already engaged by the lug J', as shown in dotted lines in Fig. 6, so that on the next stroke imparted to the lever E the numbering-wheel B carries the numbering-wheel B' with it, and the wheel, by its lever I, carries the next numbering-wheel B² with it in a similar manner to that above described in reference to the numbering-wheels B and B'. A similar movement takes place between the several numbering-wheels B, B', B², and B³ when the numbering-wheel B is moved from its numeral "9" to the numeral "0," and a like motion takes place between the numbering-wheels B, B', B², B³, and B⁴ when the numbering-wheel B³ is shifted so that its numeral "9" disappears from the opening A' and a numeral "0" appears in the same.

It will thus be seen that the motion transmitted from one numbering-wheel to the other is by a direct mechanical movement without the aid or use of a spring. It will further be seen that the movement is always positive, and the several parts constituting the improvement are not liable to get out of order.

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

1. The combination, with consecutive numbering-wheels, of a lever mounted to turn axially in the periphery of each of the said wheels and provided with two arms at its opposite ends standing at angles to each other, the lever being adapted to engage the next numbering-wheel to carry it along, substantially as shown and described.

2. The combination, with consecutive numbering-wheels, of a lever mounted to turn axially in the periphery of each of the said wheels and provided with two arms at its opposite ends standing at angles to each other, the lever being adapted to engage the next numbering-wheel to carry it along, and means, substantially as described, for shifting the position of the said lever, as set forth.

3. In a register, the combination, with two

successive numbering-wheels, of a lever mounted to turn in one of the said numbering-wheels and having two arms standing at right angles to each other and a fixed lug on the register-frame, adapted to engage one of the arms of the said lever to throw the other arm in engagement with the other numbering-wheel, substantially as shown and described.

4. In a register, the combination, with two successive numbering-wheels, of a lever mounted to turn in one of the said numbering-wheels and having two arms standing at right angles to each other, a fixed lug adapted to engage one of the arms of the said lever to throw the other arm in engagement with the other numbering-wheel, and a fixed slotted disk for disengaging the said lever, substantially as shown and described.

5. In a register, the combination, with two numbering-wheels mounted to turn, and of which the second wheel is provided with a radial arm, and a fixed disk held between the said wheels and having a segmental slot, of a lever mounted to turn in the first numbering-wheel and provided with two arms standing at right angles to each other, and of which the inner one is adapted to pass through the said segmental slot to butt against said radial arm on the said second numbering-wheel, substantially as shown and described.

6. In a register, the combination, with two numbering-wheels mounted to turn, and of which the second wheel is provided with a radial arm, and a fixed disk held between the said wheels and having a segmental slot, of a

lever mounted to turn in the first numbering-wheel and provided with two arms standing at right angles to each other, and of which the inner one is adapted to pass through the said segmental slot to butt against said radial arm on the said second numbering-wheel, and a fixed lug adapted to engage the other outer arm of the said lever to hold the latter in place while the other butts on the said radial arm, substantially as shown and described.

7. In a register, the combination, with a numbering-wheel, of a lever mounted to turn in the periphery of the said wheel and provided with two arms at its opposite ends standing at right angles to each other, of which one extends on the outside of the periphery and the other is adapted to swing in a recess in the side of the said wheel, substantially as shown and described.

8. In a register, the combination, with a numbering-wheel, of a lever mounted to turn in the periphery of the said wheel and provided with two arms at its opposite ends standing at right angles to each other, of which one extends on the outside of the periphery and the other is adapted to swing in a recess in the side of the said wheel, and a fixed lug on the register-frame, adapted to be engaged by the outer arm of the said lever to change the position of the latter, substantially as shown and described.

RUDOLPH RUHLMAN.

Witnesses:

CHARLES BRIEST,

C. FRED. RUHLMAN.