

(No Model.)

G. R. LEAN.
ELECTRIC SWITCH.

No. 446,623.

Patented Feb. 17, 1891.

Fig: 1.

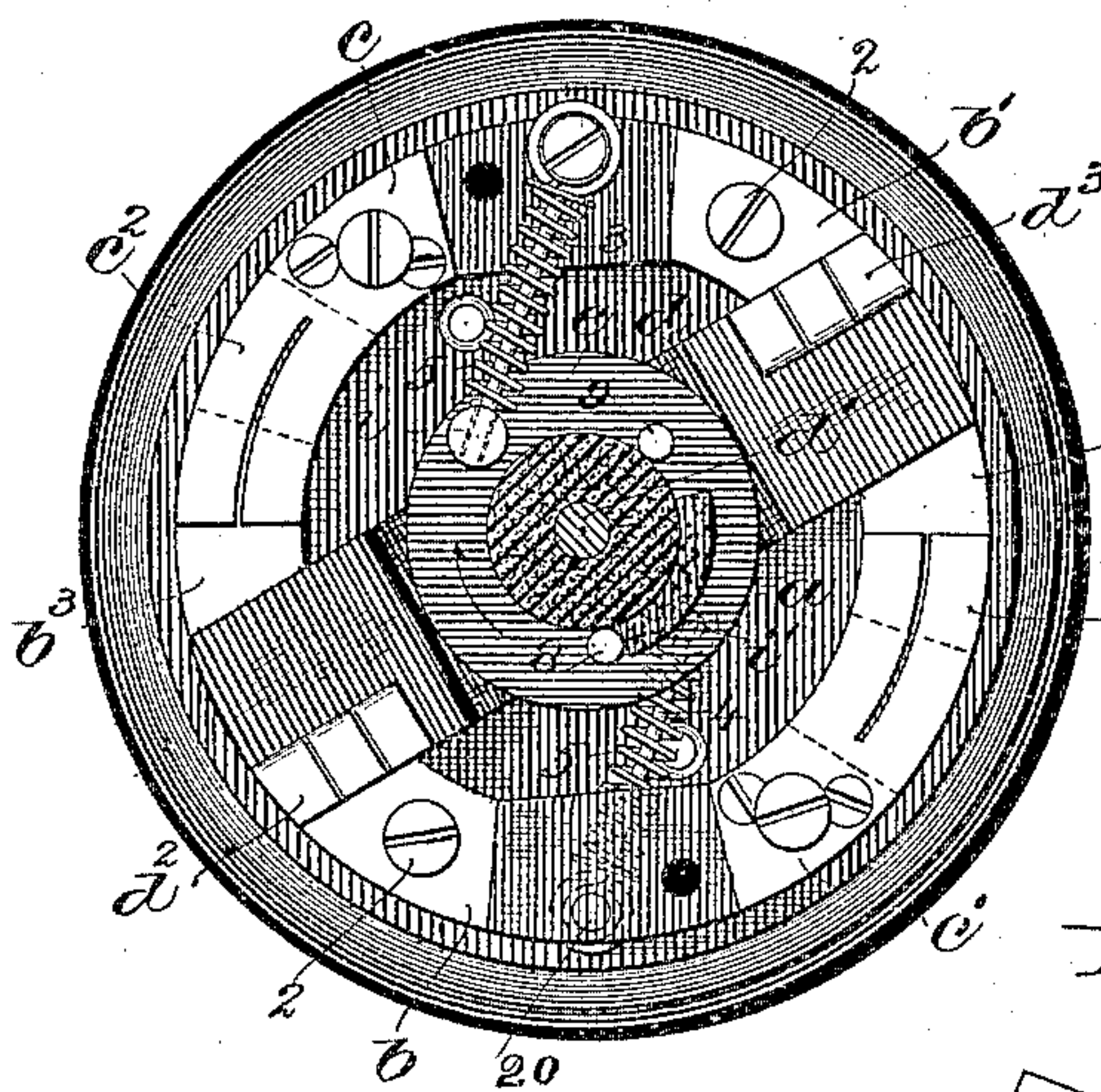


Fig: 2.

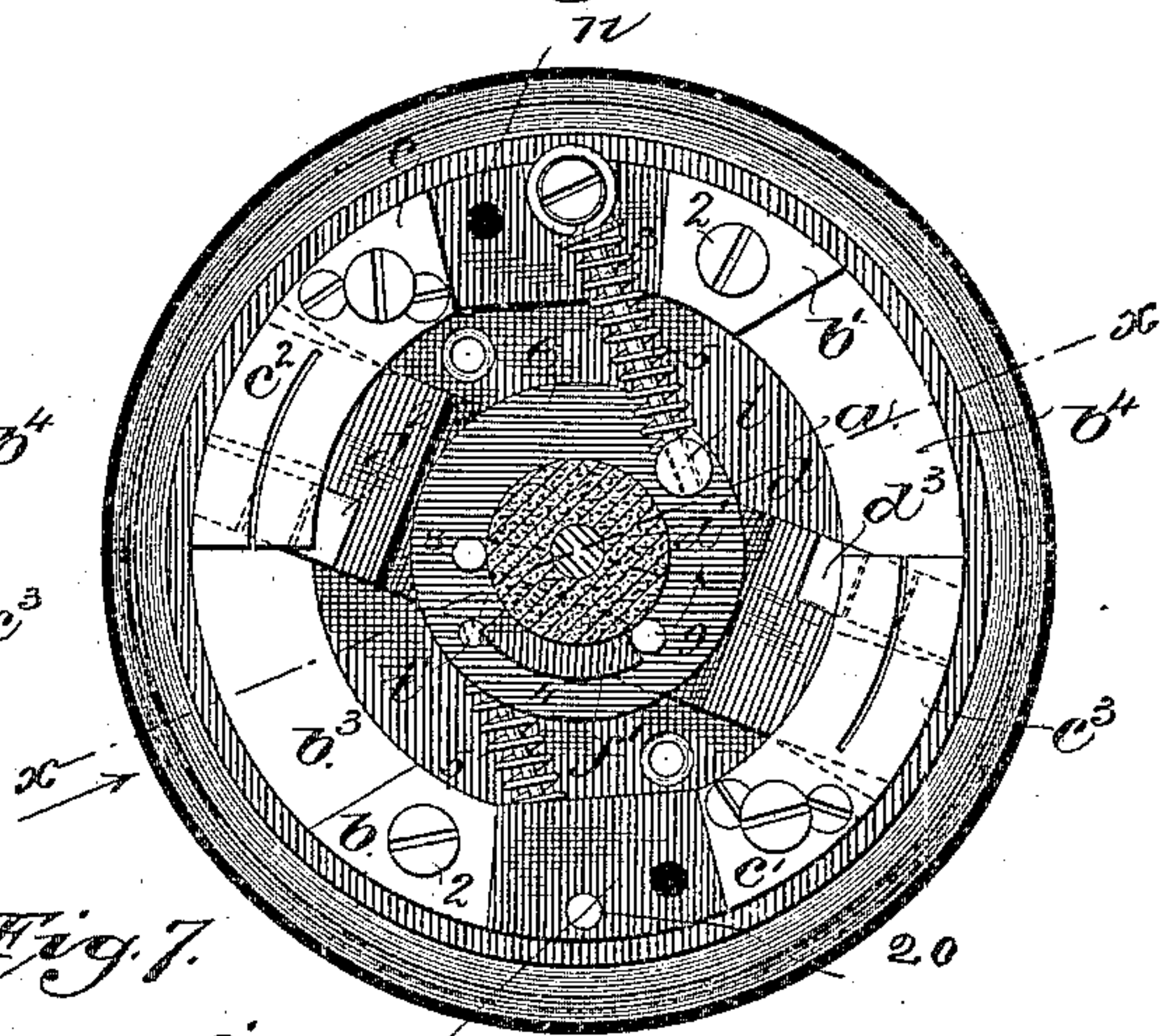


Fig: 3.

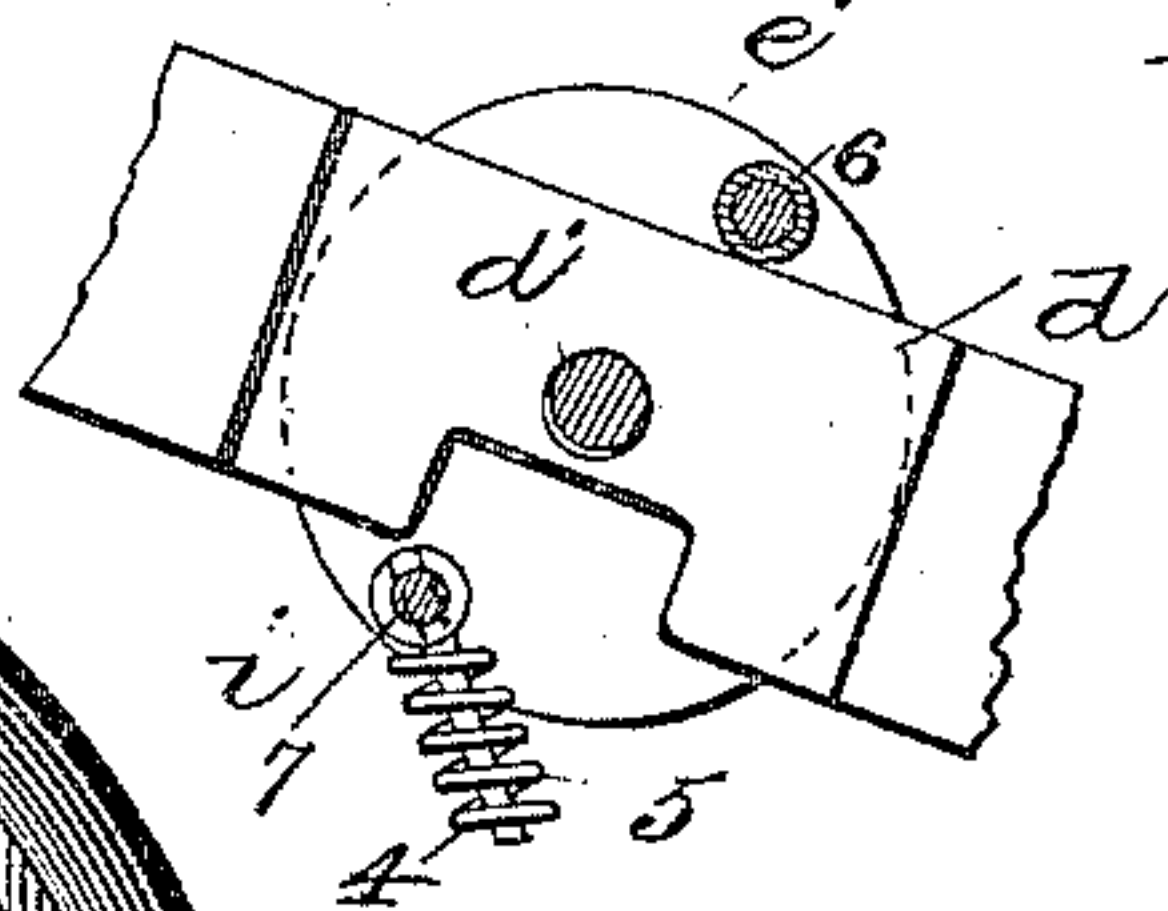
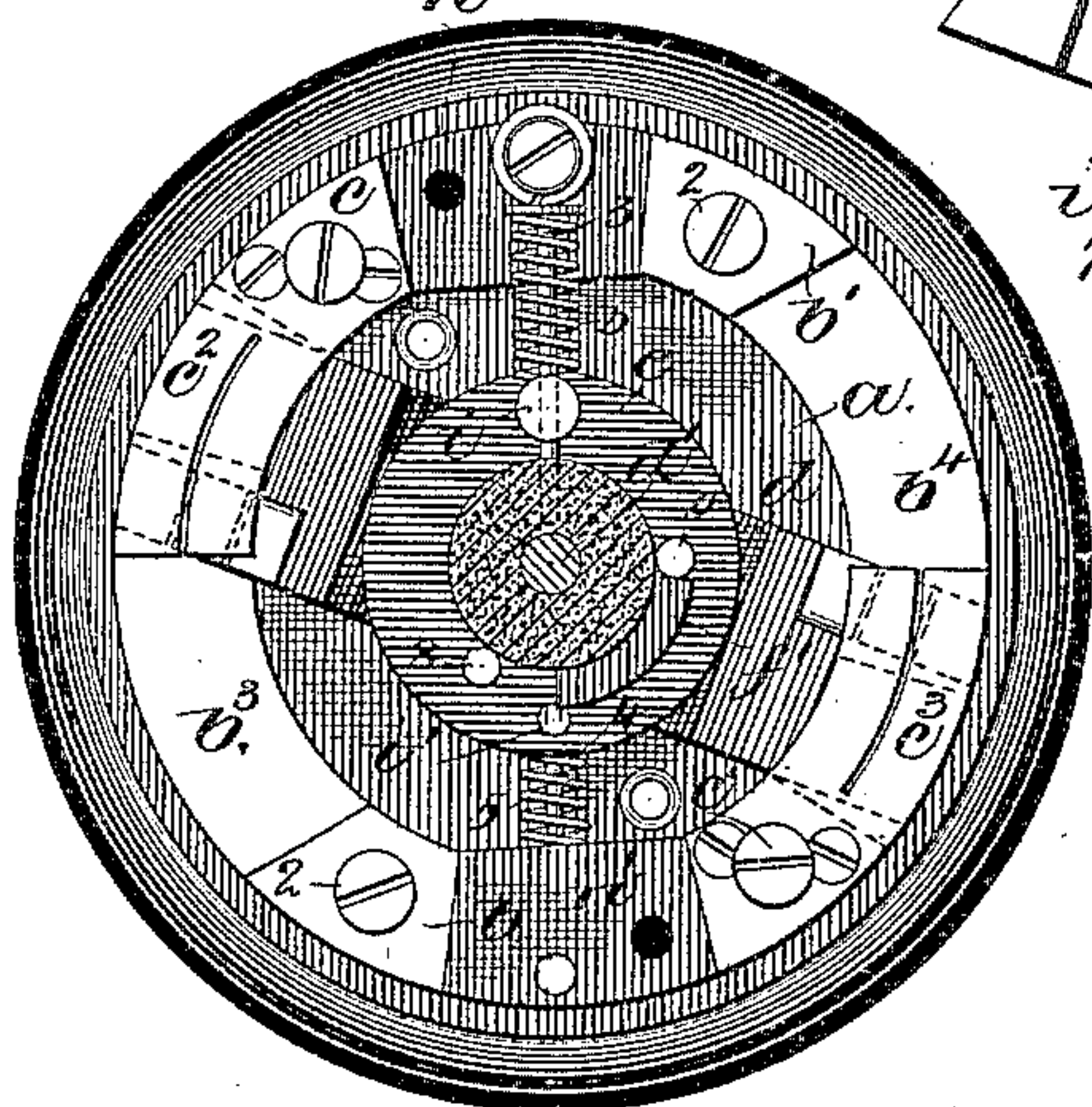


Fig: 4.

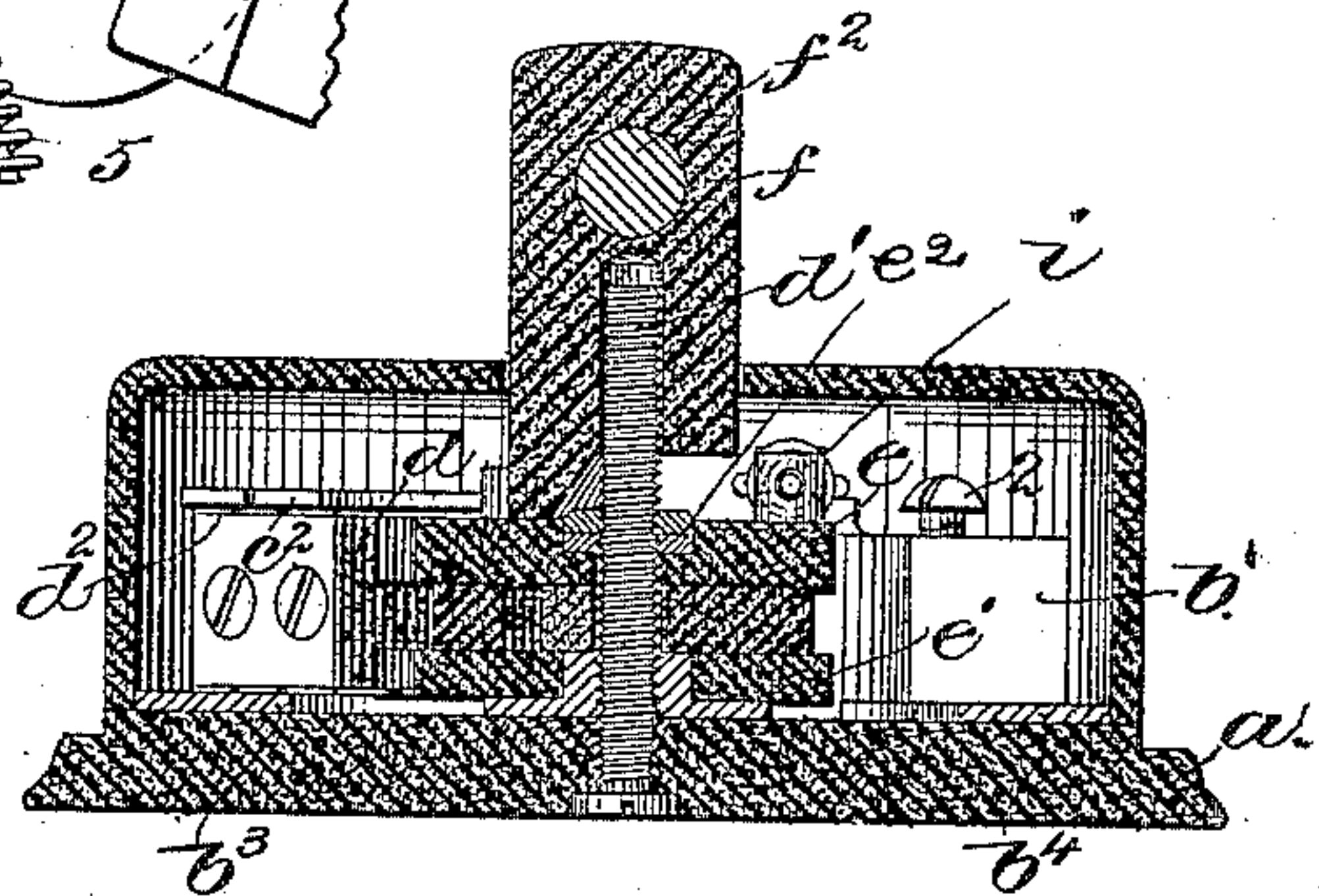


Fig: 6.

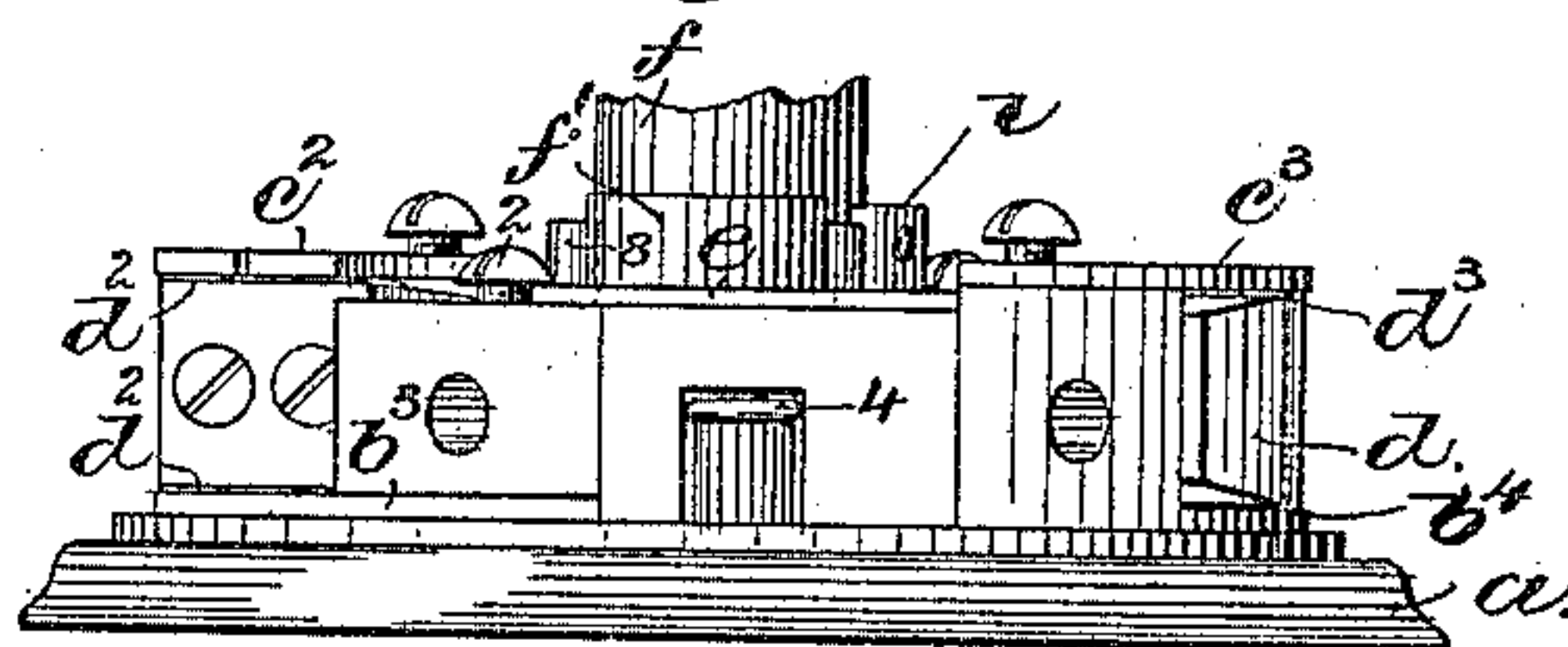
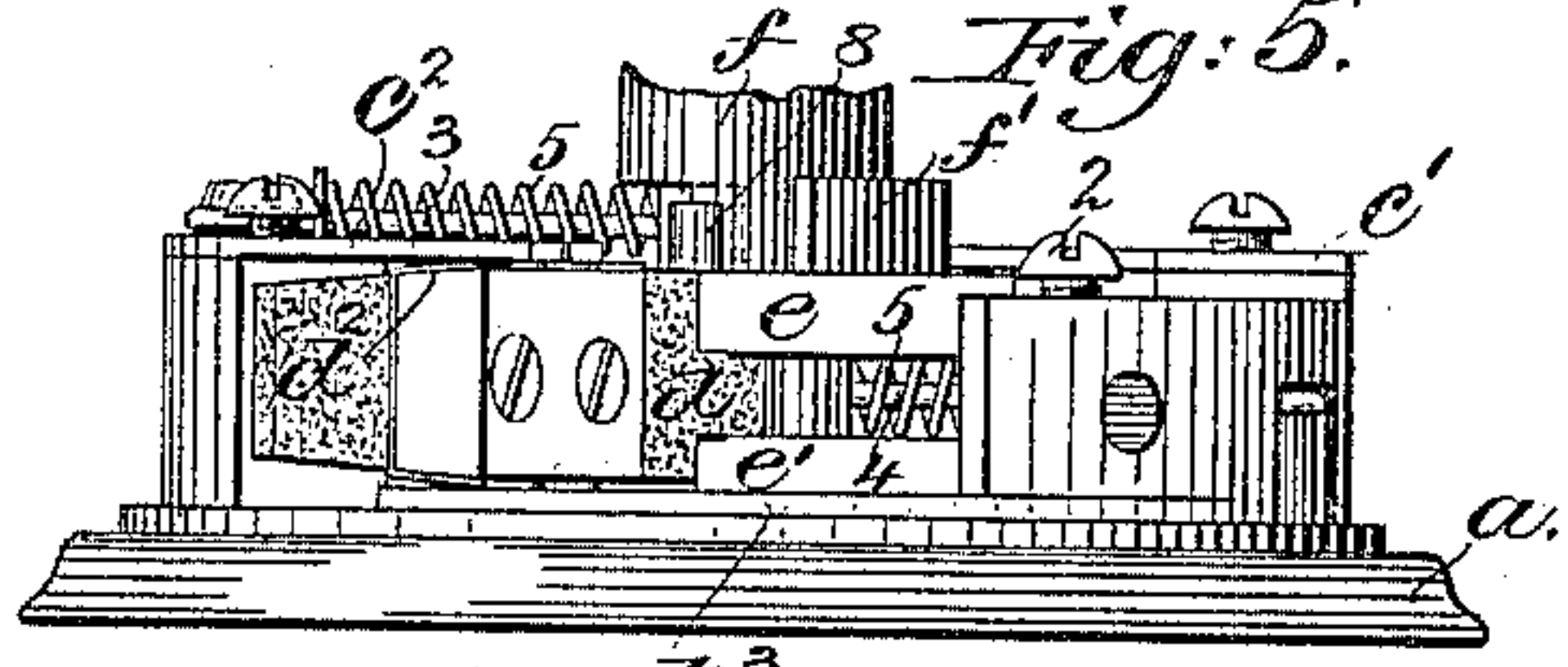


Fig: 5.



Witnesses.
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UNITED STATES PATENT OFFICE.

GEORGE R. LEAN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE BERNSTEIN ELECTRIC COMPANY, OF PORTLAND, MAINE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 446,623, dated February 17, 1891.

Application filed May 12, 1890. Serial No. 351,505. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. LEAN, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Electric Switches, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to construct an electric switch especially adapted for heavy currents, it being what is commonly termed a "quick-acting" or "jump" switch, and especially designed for multiple-arc lighting.

My invention consists in details of construction to be hereinafter pointed out in the claims.

Figure 1 shows in plan view a switch embodying this invention, the cover being removed to expose the parts which are in position to disconnect the branch wires from the line-wires; Fig. 2, a similar view, the parts being in position to connect the branch wires with the line-wires; Fig. 3, a similar view, the parts being in position to connect the branch wires with the line-wires, but the operating member or handle being turned to place the actuating-springs directly at opposing points; Fig. 4, a cross-sectional view of the switch shown in Fig. 2, taken on the dotted line xx , the cover being placed in position; Figs. 5 and 6, edge views of the device shown in Fig. 2; Fig. 7, a vertical section of the switch, showing more fully the switch-arm and pins for moving it.

The base a is of suitable shape and construction to support the operating parts above it, being herein shown as circular. The base a has erected on it two conducting-blocks $b b'$ at opposite sides, and to these blocks the line-wires are connected by suitable screws 2. Leading from these conducting-blocks $b b'$ at the bottom are short flat curved conducting-plates $b^3 b^4$. These plates terminate as represented by dotted lines, Figs. 1, 2, and 3. Also erected on the base a are conducting-blocks $c c'$ at opposite sides, and flexible conducting-plates $c^2 c^3$ are secured to the tops of these blocks $c c'$, being curved in substantially the same arc as the curved plates $b^3 b^4$ and overlapping them a short distance. A switch-arm or cross-bar d is placed loosely on a pin d' ,

which passes up through the center of the base a . This switch-arm d is hence diametrically arranged on the base, and it has secured to it at opposite sides, at the ends, a conducting-block $d^2 d^3$, having flexible bearing-contacts arranged on or secured to them. This switch-arm d has two positions—one as illustrated in Fig. 1 and the other as illustrated in Fig. 2. As shown in Fig. 2, the path of the current will include the block b' , conducting-plate b^4 , conducting-block d^3 , contact-pens c^3 , and blocks c' at one side, and block b , conducting-plate b^3 , conducting-block d^2 , contact-pens c^2 , and block c on the other side, thereby connecting the conducting-blocks $c c'$ with the line-wires, which may be connected at 2. As shown in Fig. 1, the conducting-blocks $c c'$ are entirely disconnected from the line-wire blocks $b b'$.

The switch-arm d , arranged loosely on the pin d' , is placed between two plates $e e'$, one of which, as e' , is beneath the switch-arm and rests on a metallic bushing secured to the pin d' on the base a , being free to turn thereon, and the other of which, as e , is above the switch-arm d and rests on said arm, being held on the pin d' by suitable washers e^2 . The top plate e has on it a post i , having a hole through it, and the bottom plate e' has on it a post i' , having a hole through it, it being located diametrically opposite the post i .

A rod 3 is loosely arranged on a support n , of insulating material, erected on the base a , and a like rod 4 is loosely arranged on a like support n' , erected on the base a . Spiral springs 5 encircle the rods 3 4, one of the ends thereof bearing against the rod-supporting post on the blocks $n n'$ and the opposite ends bearing against the posts $i i'$, respectively.

The plate e has secured to its under side a pin 6, being an extension of the post i , and the plate e' has secured to its upper side a pin 7, substantially diametrically opposite the pin 6, this pin 7 being an extension of the post i' and passing up through the plate e , rigidly connecting the plates e and e' together. These pins 6 7 bear one on each side of the switch-arm d at opposite sides of its pivotal connection, so that as the plates are turned the pins 6 7 will move the switch-arm in one

or the other direction, depending on which direction the said plates are turned. The plate *e* has on it two pins 8 9 a short distance apart and equidistant from the circumference of the plate, and the block *f* is placed loosely on the pin *d'*, bearing on the plate *e*, it having a segmental flange *f'* on it at its lower end, which occupies a position between the pins 8 9, the length of said flange being considerably less than the distance between said pins, so that the block may move freely and independently. A cross-bar or arm *f*² is secured to the block *f*, by which it may be turned.

Referring to Fig. 2, when the block *f* is turned in the direction of the arrow there shown, the flange *f'* will bear against the pin 9 on the plate *e* and will turn said plate in the same direction, the rod 3 moving freely through the hole in the post *i* and compressing the spring, while the plate *e'* will be also turned in the same direction, the rod 4 moving freely through the hole in the post *i'* and compressing the spring until the parts are in the position shown in Fig. 3. With the parts in this position the rods 3 4 are in alignment and the compressed springs 5 directly opposite each other, and by giving the block *f* a further slight progressive movement the rods 3 4 will pass the dead-centers, and there being nothing to resist the pressure of the springs 5 they immediately resume their normal condition and turn the plates *e e'* independently of the block *f* a part of a revolution. As the plates *e e'* are turned by the block *f* the pins 6 7 pass from one to the other side of the pivotal point of the switch-arm, so that when the springs 5 distend the said pins 6 7 will act upon and move said switch-arm, it being understood that the switch remains at rest during the movement of the block *f* from the position shown in Fig. 2 to the position shown in Fig. 3. To return the switch-arm the block will be turned in the opposite direction, as represented in Fig. 1, the flange *f'* bearing on the pin 8, the operation of the parts being substantially the same as just described. By this form of switch the block *f* or other operating member may be given substantially its complete movement, storing up the power by the springs *f* to move the switch-arm, which power is expended while the operating member remains at rest, thereby performing the functions of a quick-acting or jump switch; also, to overlap the conducting-plates *b*³ *b*⁴ by the contact-plates *c*² *c*³, the current is carried without interruption. If it should be attempted to move the switch-arm *d* by means other than the handle and plates *e e'*, the rod 4 will strike the side of said arm and lock it. This effectually prevents movement of the switch-arm by accident.

I claim—

1. In an electric switch, a switch-arm pivoted at *d'*, a plate, as *e*, arranged on said pivot *d'*, a pin, as 6, secured to said plate and adapted

to bear against and move the switch-arm, a spring, as 5, a loosely-supported rod, as 3, and an operating member for moving said plate *e* a short distance, compressing the spring 5, and moving the pin 6 away from contact with the switch-arm at one side of the center into engagement therewith at the opposite side of the center, that said pin 6 may be moved by the spring 5 to move the switch-arm, substantially as described.

2. In an electric switch, a switch-arm and contact-blocks therefor, springs for moving said switch-arm, and means for compressing said springs, combined with a locking device for the switch-arm, consisting of a rod, as 4, its inner end normally in the path of movement of the switch-arm, a support therefor independent of the switch-arm, and means for moving said support in advance of the switch-arm to remove the rod 4 from the locking position, substantially as described.

3. In an electric switch, a switch-arm pivoted at *d'* and conducting-blocks therefor, springs for moving said switch-arm, and means for compressing said springs, combined with a stud 20 and a rod 4, loosely connected to said stud, which contacts with the side of and prevents an independent movement of the switch-arm where said rod is at one or the other side of the pivot *d'*, a support for said rod 4 independent of the switch-arm, and means for moving it in advance thereof, substantially as described.

4. In an electric switch, the line-wire blocks and conducting-blocks and conducting-plates between them, as described, and a switch-arm having conducting portions at the end, combined with the plates *e e'*, having pins 6 7, for moving the switch-arm, and pins 8 9, a block *f*, having the segmental flange *f'*, located between said pins 8 9, and the springs 5, arranged on loosely-supported rods, as and for the purpose described.

5. In an electric switch, a switch-arm pivoted at *d'*, a plate, as *e*, arranged on said pivot *d'*, a pin, as 6, secured to said plate and adapted to bear against and move the switch-arm, a spring, as 5, a loosely-supported rod, as 3, and an operating member for moving said plate *e* a short distance, compressing the spring 5, and moving the pin 6 away from contact with the switch-arm at one side of the center into engagement therewith at the opposite side of the center, that said pin 6 may be moved by the spring 5 to move the switch-arm, pins 8 and 9, and the handle *f*, arranged on the pivot *d'* and having a segmental flange *f'*, adapted to work between the pins 8 9, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE R. LEAN.

Witnesses:

BERNICE J. NOYES,
FREDERICK L. EMERY.