

C. C. STIRLING.
SWITCH FOR ELECTRIC CIRCUITS.

No. 382,333.

Patented May 8, 1888.

Fig. 2.

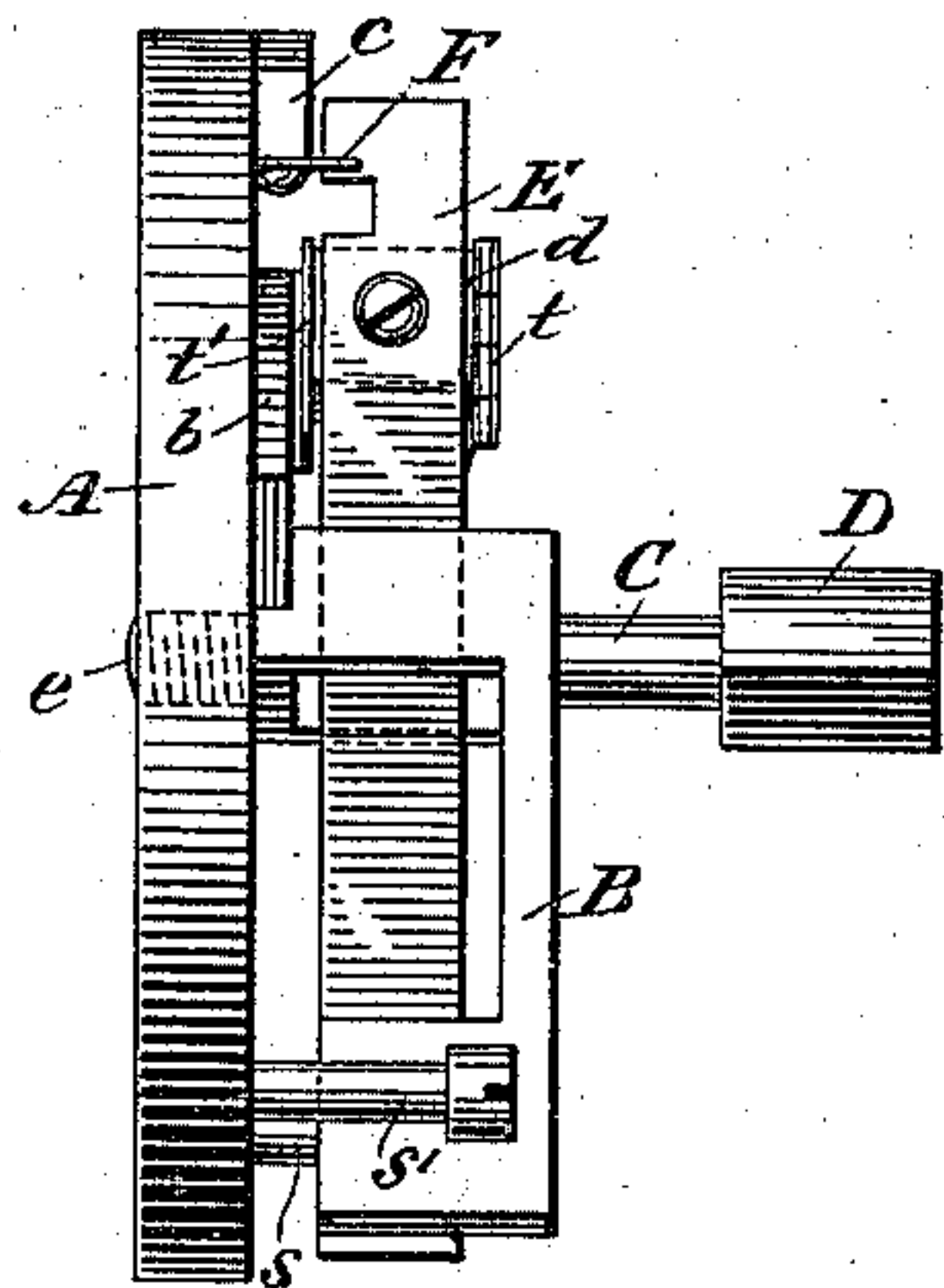


Fig. 1.

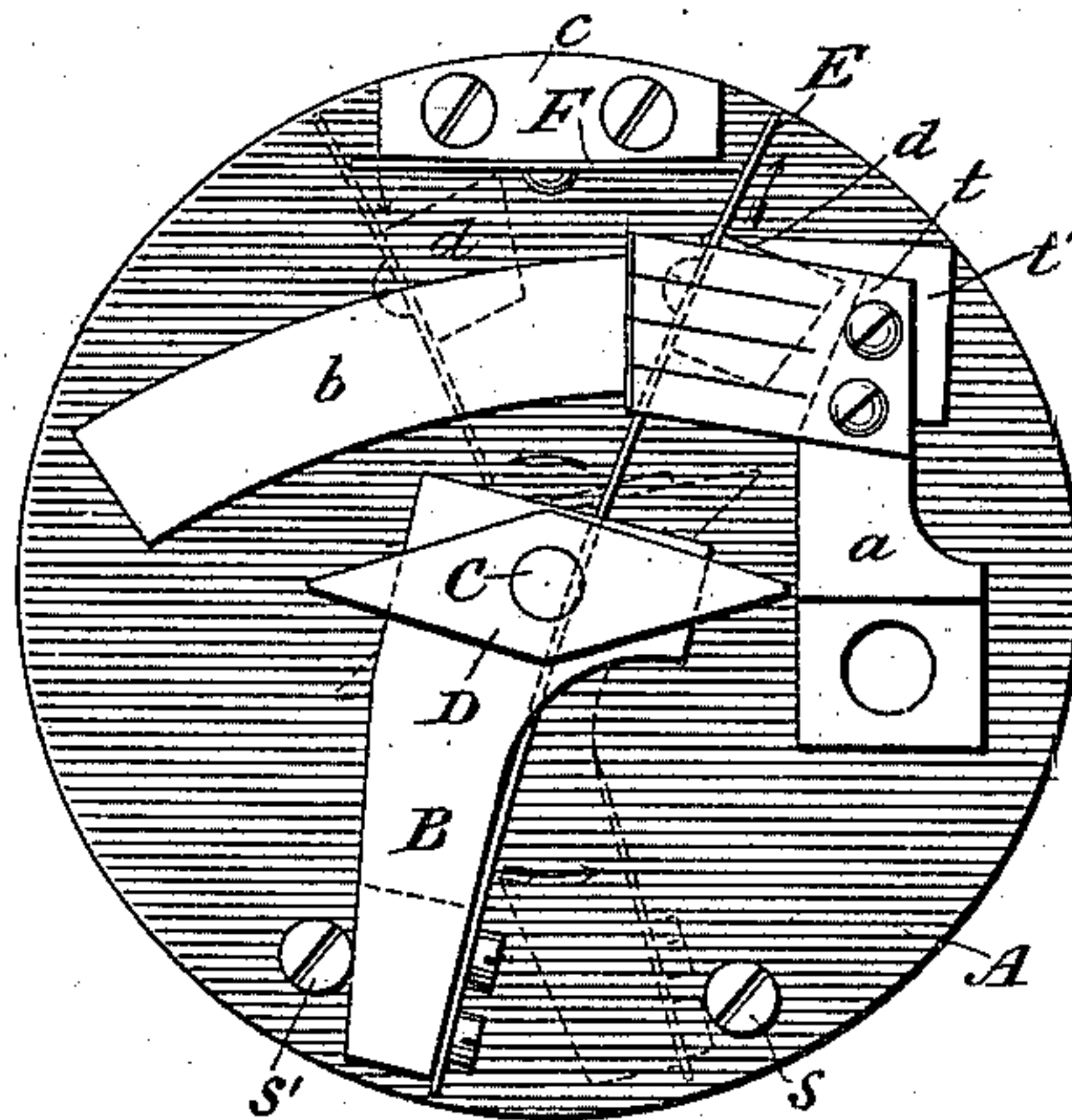


Fig. 4.

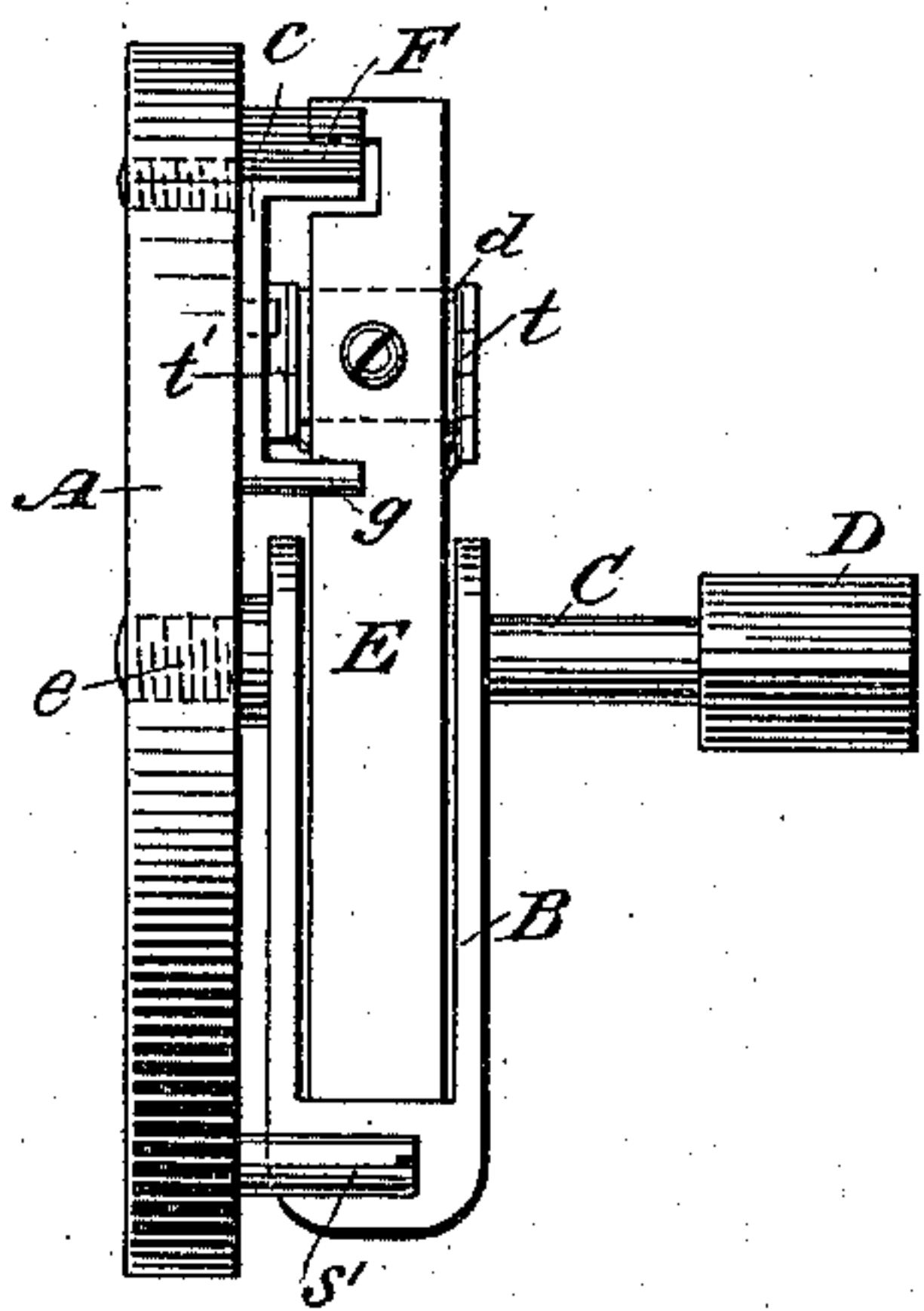
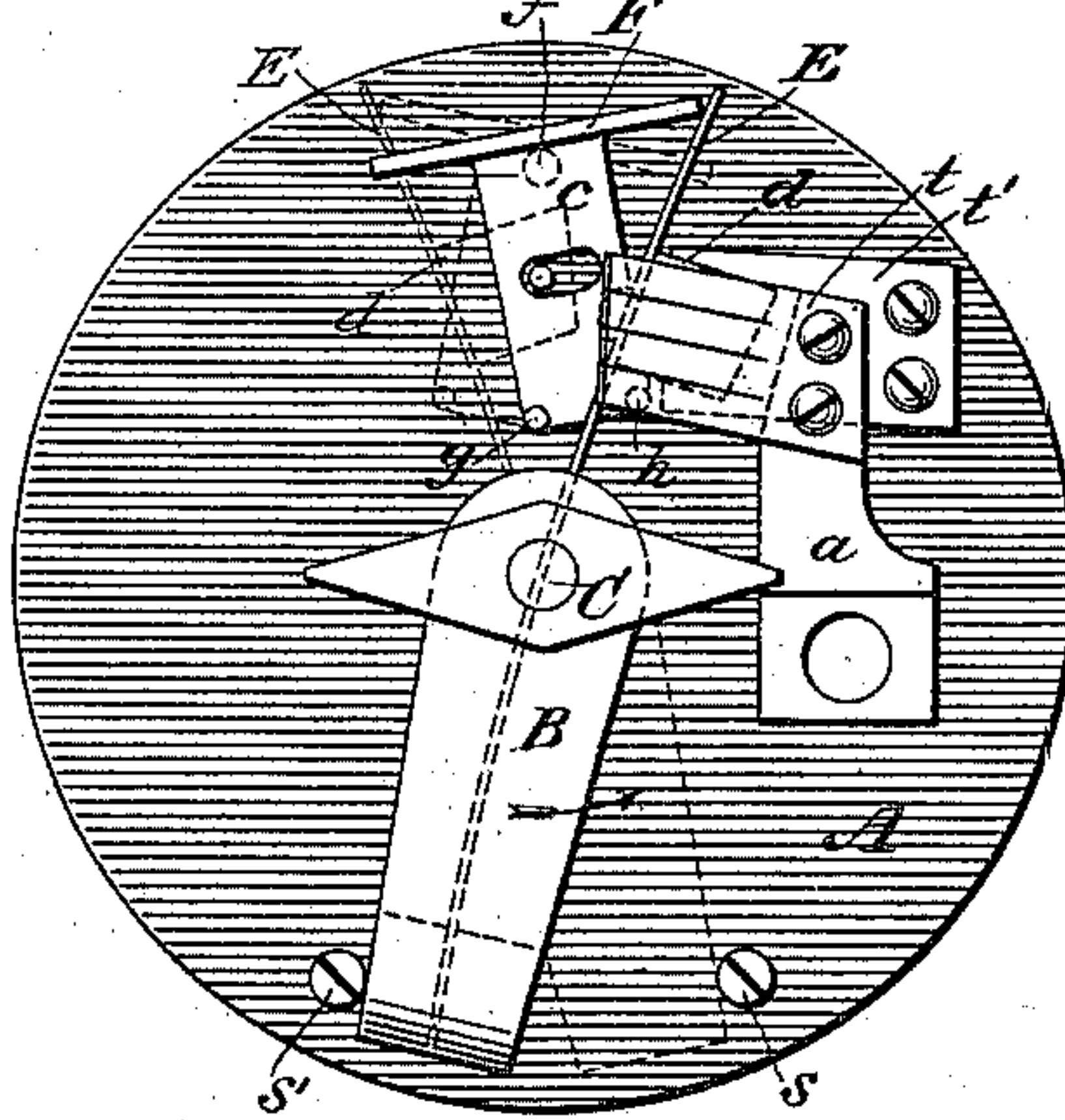


Fig. 3.



Witnesses.

Geo. W. Breck.
Carrie C. Ashley.

Inventor.

Clarence C. Stirling
By his Attorneys
Fowler & Fowler

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Fig. 6,

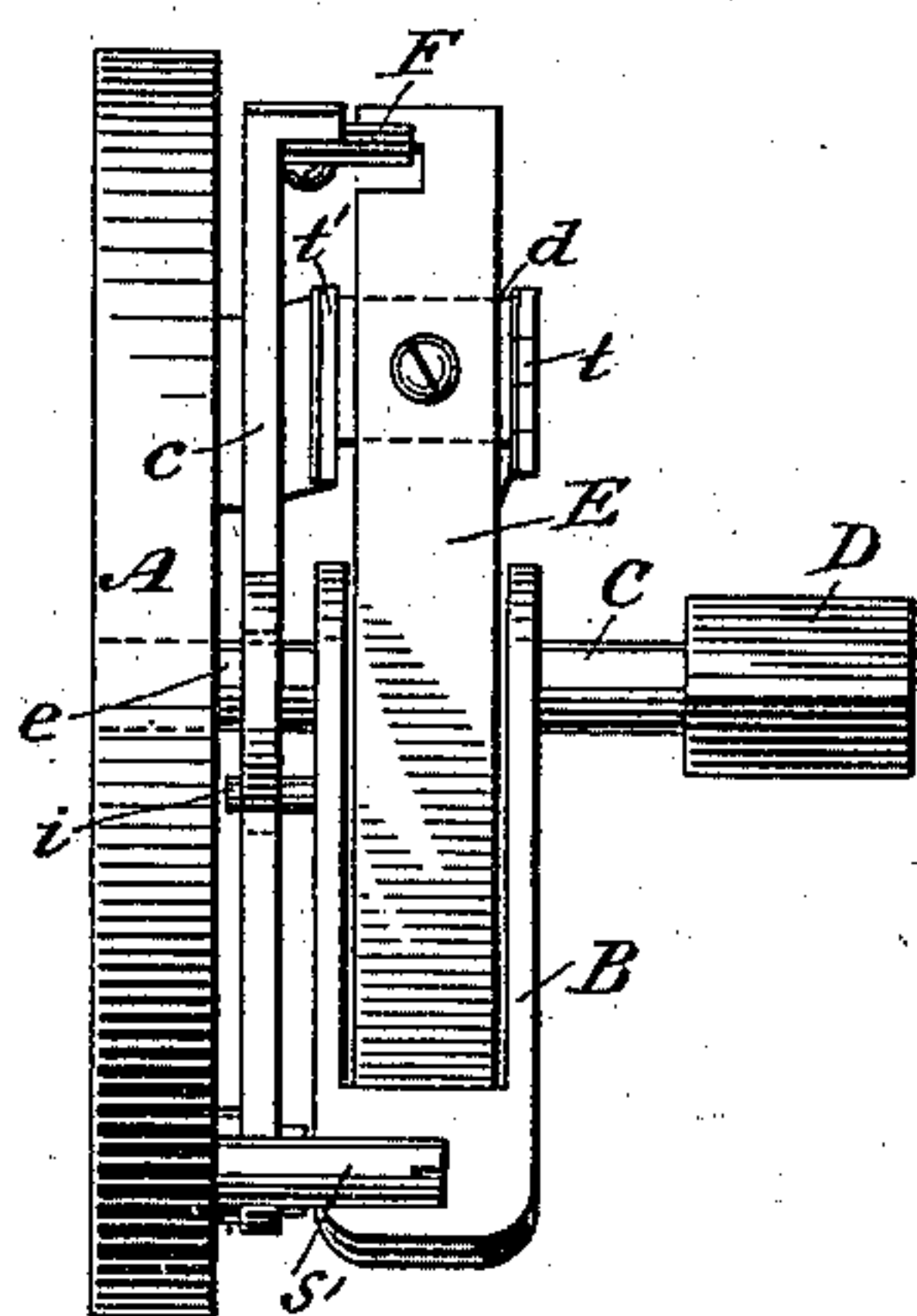


Fig. 7,

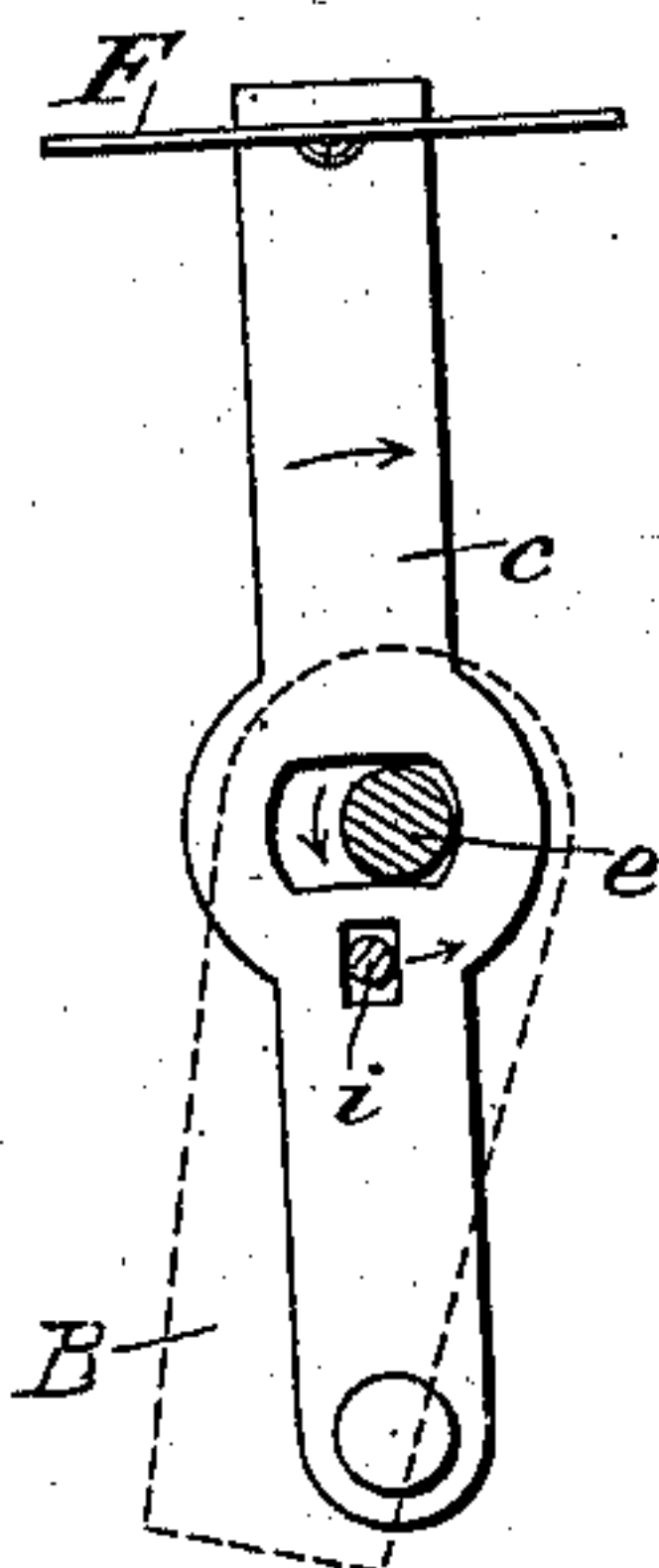


Fig. 5,

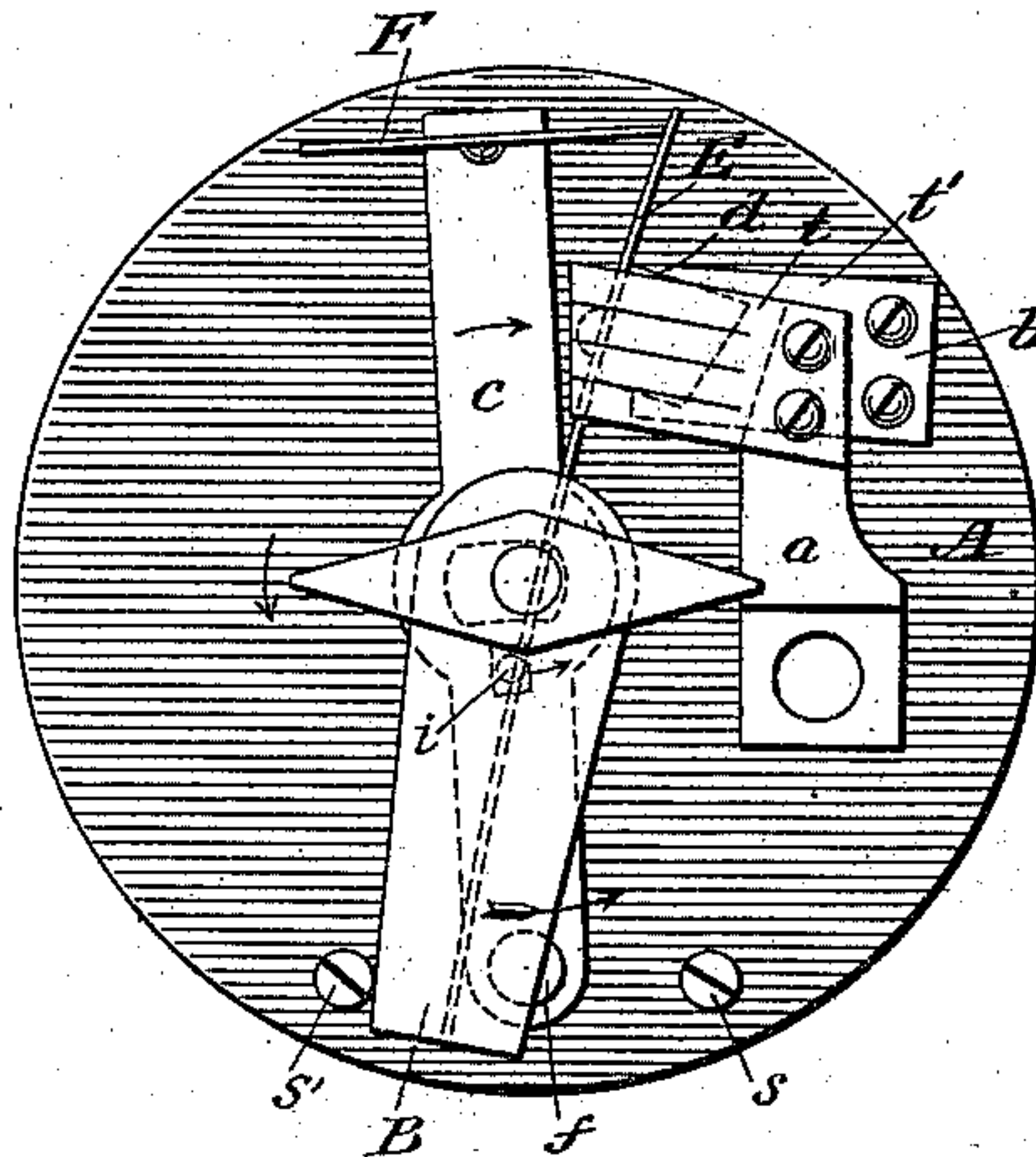


Fig. 9,

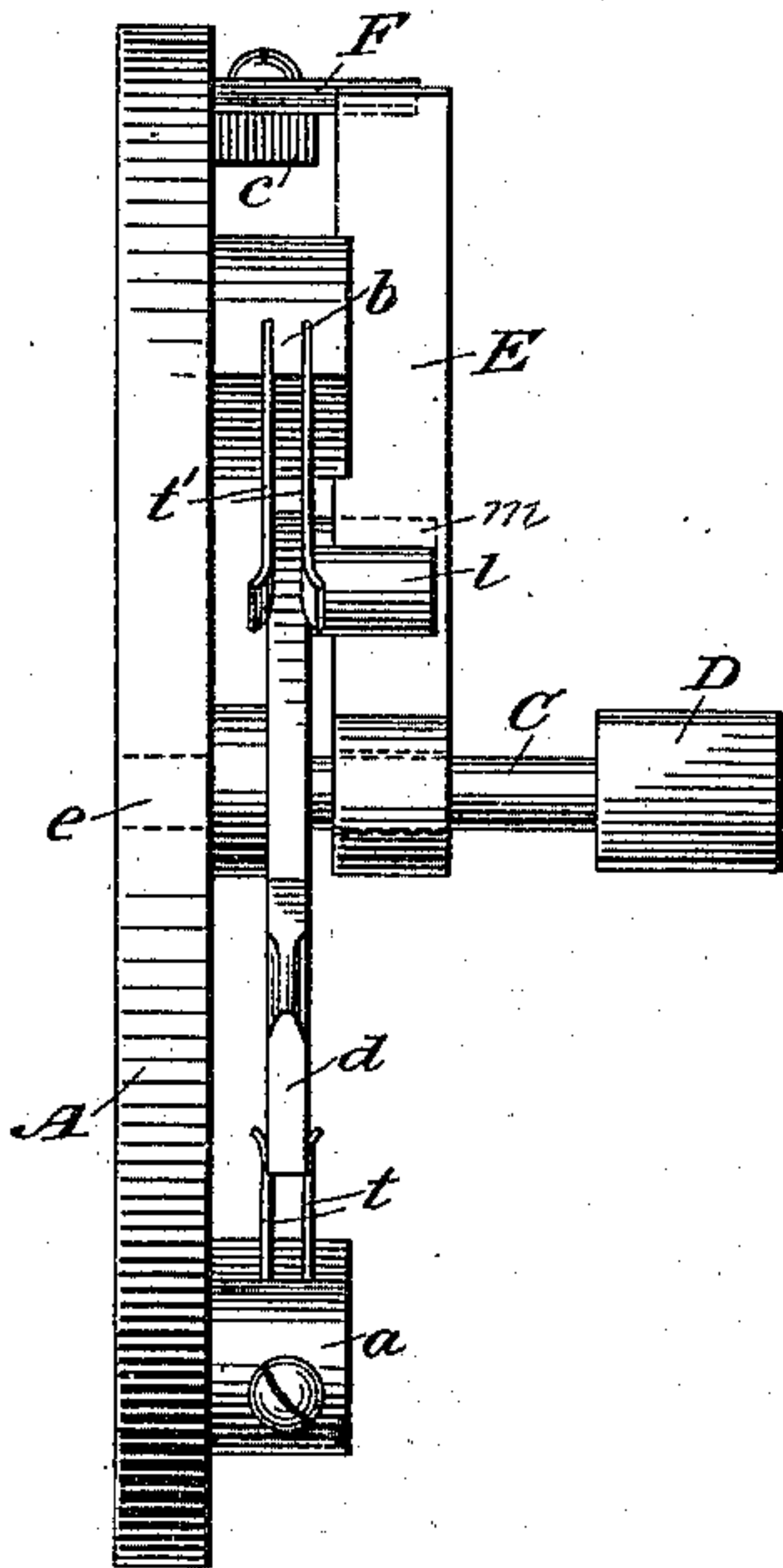
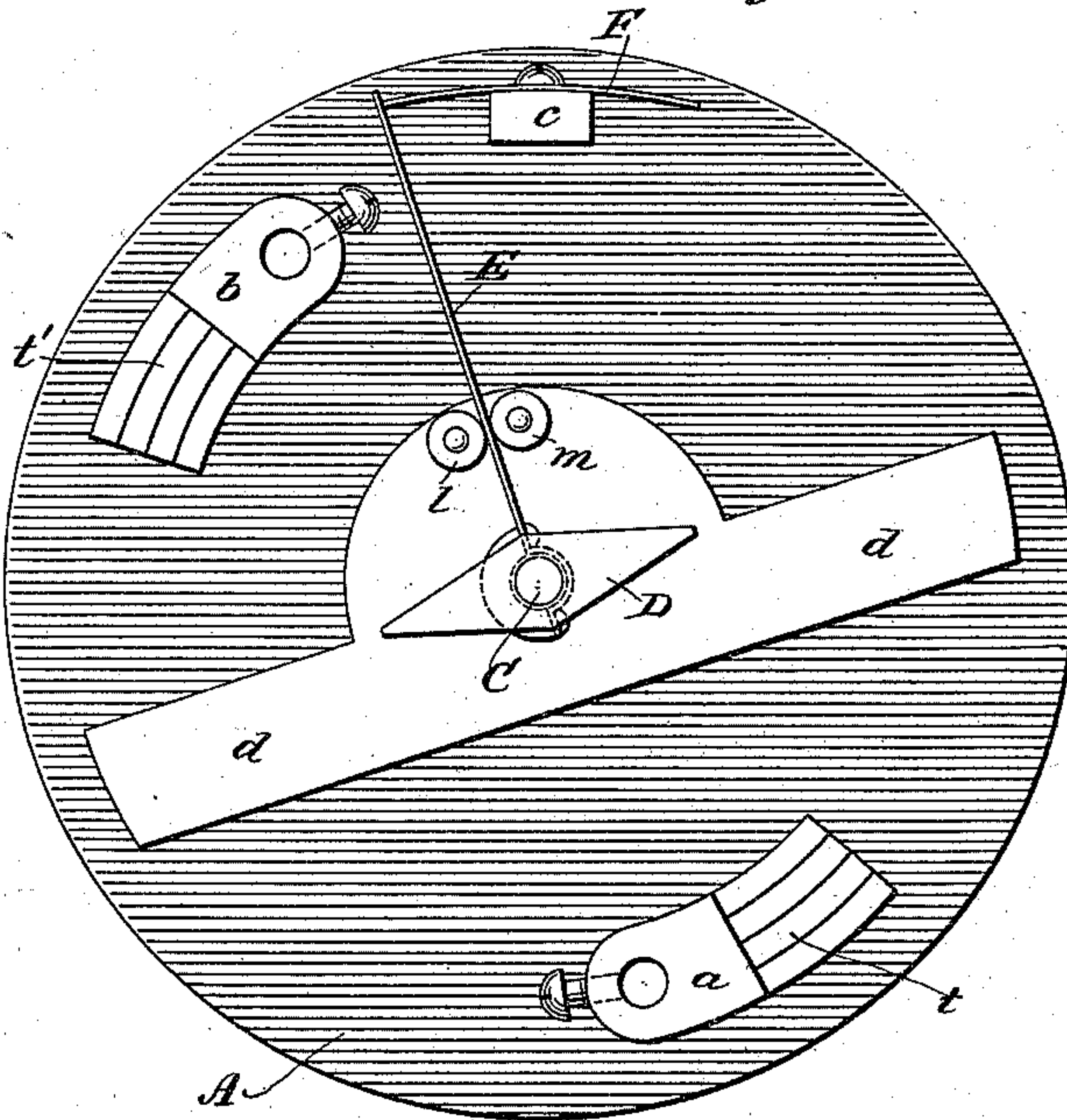


Fig. 8,



Witnesses.

Geo. W. Dreck
Carrie C. Ashley

Inventor,

Clarence C. Stirling.

By his Attorneys

Fowler & Fowler

UNITED STATES PATENT OFFICE.

CLARENCE CANFIELD STIRLING, OF HARTFORD, CONNECTICUT, ASSIGNOR
TO CHARLES E. DUSTIN, OF SAME PLACE.

SWITCH FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 382,333, dated May 8, 1888.

Application filed June 21, 1887. Serial No. 241,980. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE CANFIELD STIRLING, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Switches for Electric Circuits, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to construct an electrical switch that is simple and reliable in action, and which controls the circuit by a sudden snapping action.

The invention consists in an elastic spring fastened at one end to an operating device and held at the other end in either of two positions by a holding device, from which it is temporarily liberated when the first-mentioned end is operated, and again caught by the holding device at the limit of its excursion, the said holding device governing a circuit-controller.

Figure 1 is a plan view of my switch. Fig. 2 is a side elevation of Fig. 1, looking from the left of the latter figure. Fig. 3 is a plan view of a modification of my apparatus; Fig. 4, a side elevation of the latter; Fig. 5, a plan view of another modification; Fig. 6, a side elevation thereof; Fig. 7, a detail view of a portion of the apparatus shown in the last two figures; Fig. 8, a plan view of still another modification, and Fig. 9 a side elevation of the latter.

In the several figures of the drawings the same letters have been used to designate corresponding parts throughout the various modifications.

A represents a circular base-plate of insulating material, upon which the parts of my apparatus are disposed in a manner now to be set forth.

I will first describe the apparatus embodying the several ways in which my invention may be carried out by reference to Figs. 1 and 2, which show the preferred form of the invention, and will then subsequently designate specifically the differences of each succeeding modification over the others by stating the dif-

ference in construction and operation without describing in detail the entire structure and operation of the modifications shown.

E is a flat elastic spring, made of any suitable metal, and is attached at one end to an operating device, B, which in the majority of the figures takes the form of a double crank journaled by an extension, *e*, in the insulating base A, and carrying upon its upper side the spindle C, bearing a handle, D, for manual operation. This spring carries a circuit-completer, *d*, and is held at its other end by a holding device, F, which in Figs. 1 and 2 is a flat spring fastened at its center to a block, *c*, mounted upon the base A. The spring F is therefore movable or vibratory at its end portions. The spring E, near the holding device F, is provided with a slot, for the purpose to be set forth by and by. Adjacent to the spring, and in co-operative relation thereto, are two terminals, *t* and *t'*, mounted upon metal pieces *a b*, carried by the insulating-base A. Limiting-stops *s* and *s'* are also carried by said base to regulate the play of the crank B.

Supposing the parts of Figs. 1 and 2 to be in the position shown, the circuit will under this condition be completed from the terminal *t* to the terminal *t'* through the intervention of the circuit-completer *d*. Should now the operating device B, which is fast to one end of the spring, be turned in the direction of the arrow shown in Fig. 1 by means of handle D, the spring B, being held by the device F, will have an increase of tension put upon it, and will be moved slightly in the direction of its length (shown by the arrow in Fig. 1) until the slot in it is made to register with the spring F, at which time it will be liberated, and by means of the great tension upon it will remove the circuit-completer *d* from between the terminals *t* and *t'* by a sudden snap, the shoulder of the spring E riding along the spring F and drawing its farthestmost end from the block *c* until its end is reached, when the spring F will snap back to its original position and lock the spring E and the circuit-completer *d* in the position shown by the dotted lines. If the operating device be turned in an opposite direction by the handle D, the spring E will per-

form the same function and escape the holding device F in the same manner, and be locked by it in the same manner, in the position shown by the full lines; but the movement will be in a reverse direction.

In Figs. 3 and 4 the same parts are used, excepting the holding device F is modified. This consists of a vibratory metal piece, *c*, pivoted at *f* to the insulating base and having the holding part F rigid to this. The device has a circular slot in it, through which projects a pin secured to the base A for limiting the play of said device. From it project two pins, *g* and *h*, which are adapted to be struck by the spring E in its movements. The operation of this modification is as follows: When the spring E is operated by moving the part B in the direction of the arrow, the same action occurs as in the previous case, and the spring E escapes the holding device, as before; but in doing so it strikes the pin *g* and throws the holding device in the position of the dotted lines, and so locks the spring E and the circuit-completer away from the circuit-terminals, as clearly shown in the figure.

In Figs. 5, 6, and 7 the arrangement of the holding device F is different still. The part *c*, upon which the holding device is mounted, is movable as before, but in this instance takes the form of a long arm provided at *f*, and has a slot in it which allows it to play about the end *e* of the operating device B, which serves to confine its movement within certain bounds. Depending from the operating device is a small pin, *i*, which takes into a hole in the part *c* and serves to operate said part *c*. The operation of this modification is as follows: Supposing the parts to occupy the relation shown, when the operating device B is turned by means of handle D in the direction shown by the arrow from the stop *s'* to the stop *s*, the part *c* will also be carried in the same direction represented by the arrow, through the instrumentality of the pin *i* fastened to the part B. This will throw an increase of tension upon the spring E, which will at the same time be moved in the direction of its length, as before, and will be liberated, as in the previous instances, the end of the spring F snapping over the shoulder at the slot in the spring E and locking it in position remote from the circuit-terminals. This position will not coincide with the position of the remote end of the spring F shown in the drawings, inasmuch as the same has moved forward a distance equal to the play of the part *c*, which is brought about by the pin *i*, pending from the crank B. The spring E and holding device or spring F will thus have motions in opposite directions. The movement of the part *c*, carrying the locking-spring F, will thus facilitate the locking of the spring E. The play of the spring will not be as great as in the other instances, but will of course be sufficient to withdraw the circuit-governor *d* from between the circuit-terminals.

In Figs. 8 and 9 the arrangement is more widely different than in the other figures. In

the modification illustrated by these two figures the circuit-terminals are disposed diametrically opposite, and the circuit-completer *d* is in the form of a bar, which is adapted to bridge the space between the terminals. The spring E is also somewhat differently arranged, the slot in it being dispensed with, and it being fastened in any suitable manner to the spindle C, upon which the handle D is mounted, and which carries the circuit-governor *d*. This spring may be bowed, as shown in dotted lines in Fig. 8, and fastened by means of two screws to an enlarged portion of the spindle C or in any manner found most desirable. The circuit-completer *d* is provided with a circular extension, upon which may be mounted two stops, *l* and *m*, or pulleys may be mounted on these stops, as desired. The spring E passes between these stops and takes against the holding-spring F, which is set upon the outer face of the block *c*, and is movable or vibratory at its ends, as in the first instance. When the circuit-completer is moved in the same direction to the movements of the hands of a watch, the spring E will be caused by the stops *l* and *m* to bend until its end escapes the holding-spring F, when it will be thrown by the tension put upon it to the other end of the spring F, traveling along the inside of the same until the end is reached, when the same spring, F, will snap into its normal position and lock the spring E in its other position, the said spring during its movement carrying the circuit-completer into engagement with the circuit-terminals by a sudden snapping action, as in the previous instances. A reverse movement will remove the circuit-governor *d* from contact with the terminals *t* and *t'*, the function of the parts being the same as stated.

It will be seen that the holding device F has a movement in all the modifications described, and that the spring E has the same functions throughout all the modifications and controls the circuit-governor.

It is obvious that my invention may be embodied in various other modifications without departing from the spirit of my invention, and that the construction shown may be varied in many ways and still be within the scope of the invention; and I reserve the right myself, should I deem it advisable, to make all these changes, which I desire to protect and secure by Letters Patent, in which I claim—

1. A switch for electric circuits embodying, essentially, a movable elastic spring, an operating device fast to one end of said spring, a vibratory lock for holding it at the other end in either of two positions, a circuit-governor controlled by said spring, and electric terminals in the path of said circuit-governor.

2. A switch for electric circuits, consisting of a movable elastic spring, a circuit-controller governed thereby, electric terminals in the path of the latter, a vibratory lock for holding said spring in either of two positions to keep the circuit-controller between said terminals or away from the same, and an operating device

secured to and supporting the other end of said spring.

3. The combination, in a switch for electric circuits, of an elastic spring having a slot in it, an operating device attached to one end thereof having means for actuating it, a device for holding the other end near the slot in either of two positions, a circuit-governor controlled by the spring, two electric terminals arranged adjacent thereto, all arranged and combined, whereby the holding device will pass through the slot and liberate the spring when the operating device is actuated and control the circuit, as set forth.

4. The combination, in an electric switch, of an elastic spring, as E, a movable device, as F, for holding the same at one end, an operating device attached to the other end, a circuit-governor, as *d*, controlled by the spring, and two electric terminals, as *t t'*, arranged adjacent to the latter.

5. The combination, in an electric switch, of an elastic spring, as E, having a slot in it, a device, as F, for holding it at one end near the slot, an operating device, as B, attached to the other end, a circuit-governor, as *d*, carried by the spring, and two electric terminals, as *t t'*, arranged adjacent to the latter.

6. The combination, in an electric switch, of an elastic spring, as E, having a slot in it, a spring, as F, fastened at its center for holding it at one end near the slot, a double crank, as B, attached to the other end for operating the same, a circuit-governor, as *d*, carried by the spring E, and two electric terminals, as *t t'*, arranged adjacent thereto.

7. The combination, in an electric switch, of an elastic spring, as E, having a slot in it, a spring, as F, fastened at its center for holding it at one end near the slot, a double crank, as B, attached to the other end for operating the same, having a handle, D, upon the outer end thereof for manual operation, stops, as *s s'*, for limiting the play of said crank, a circuit-governor, as *d*, carried by the spring E, and two electric terminals, as *t t'*, arranged adjacent thereto.

In testimony whereof I have hereunto set my hand and seal, this 26th day of November, 1886, in the presence of the two subscribing witnesses.

CLARENCE CANFIELD STIRLING. [L. S.]

Witnesses:

JOHN N. MOORE,

DANIEL J. GLAZIER.