

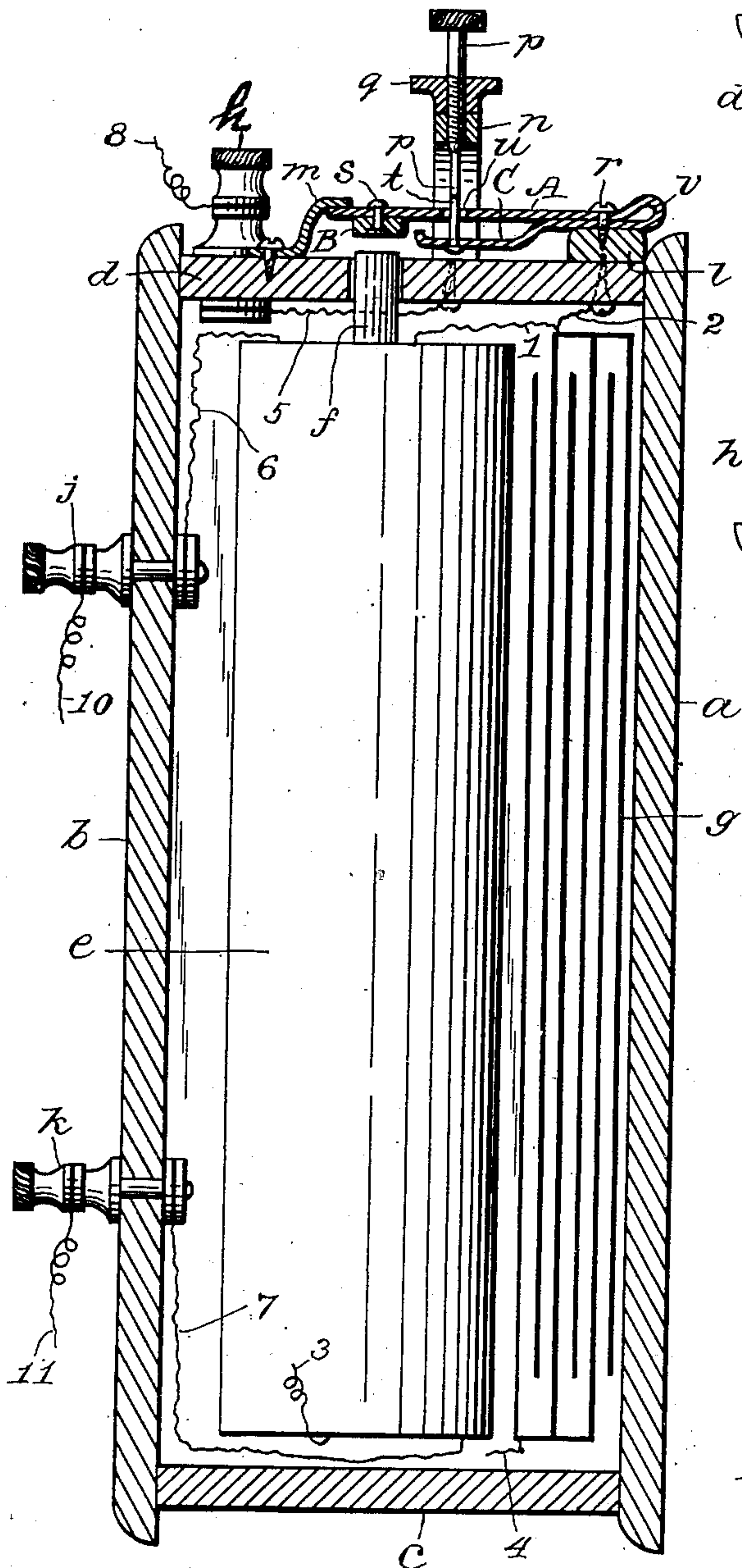
A. H. DEISHER.

CIRCUIT BREAKER FOR JUMP SPARK COILS.

APPLICATION FILED APR. 13, 1903.

NO MODEL.

Fig. 1.



a Fig. 2.

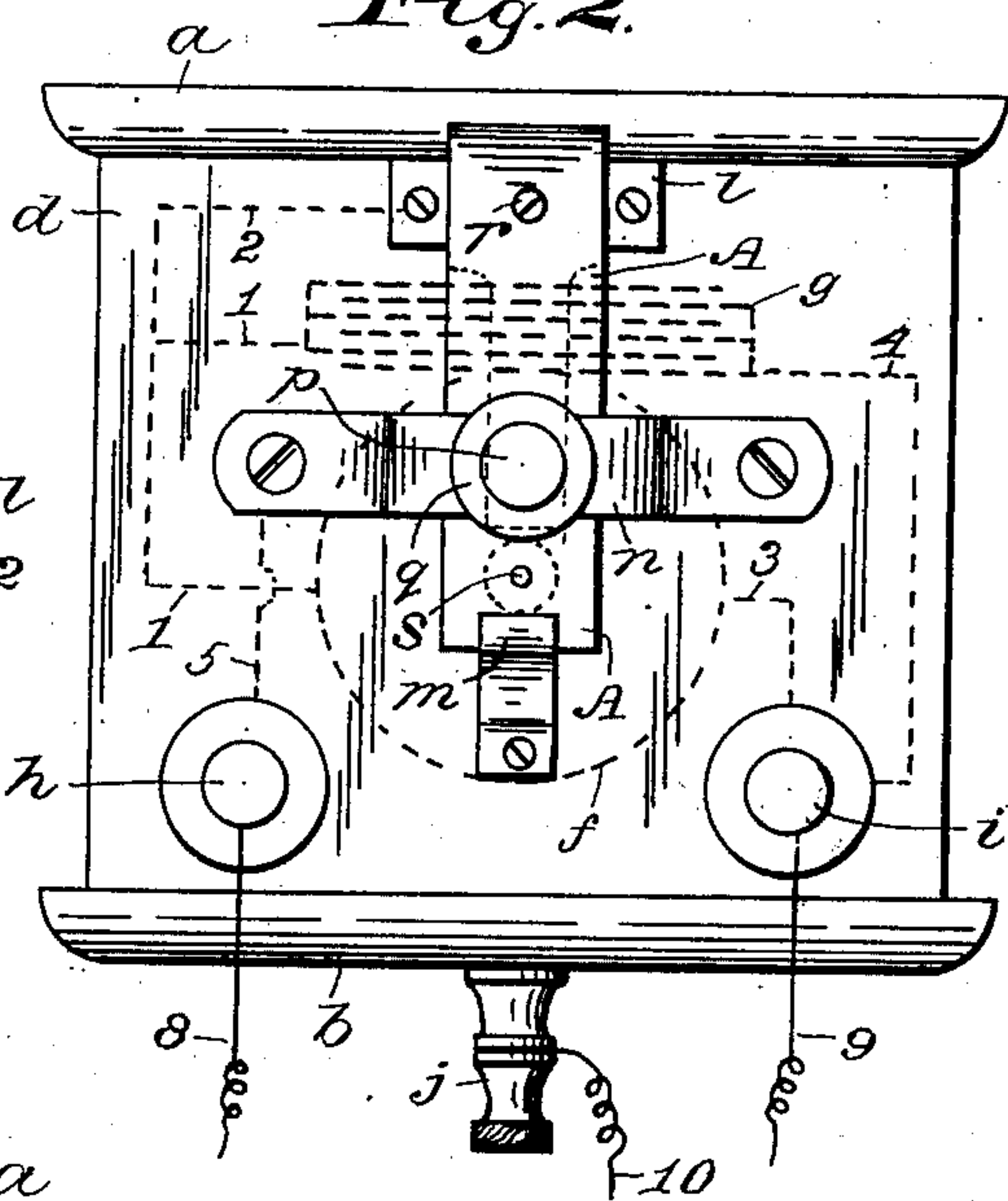


Fig. 3.

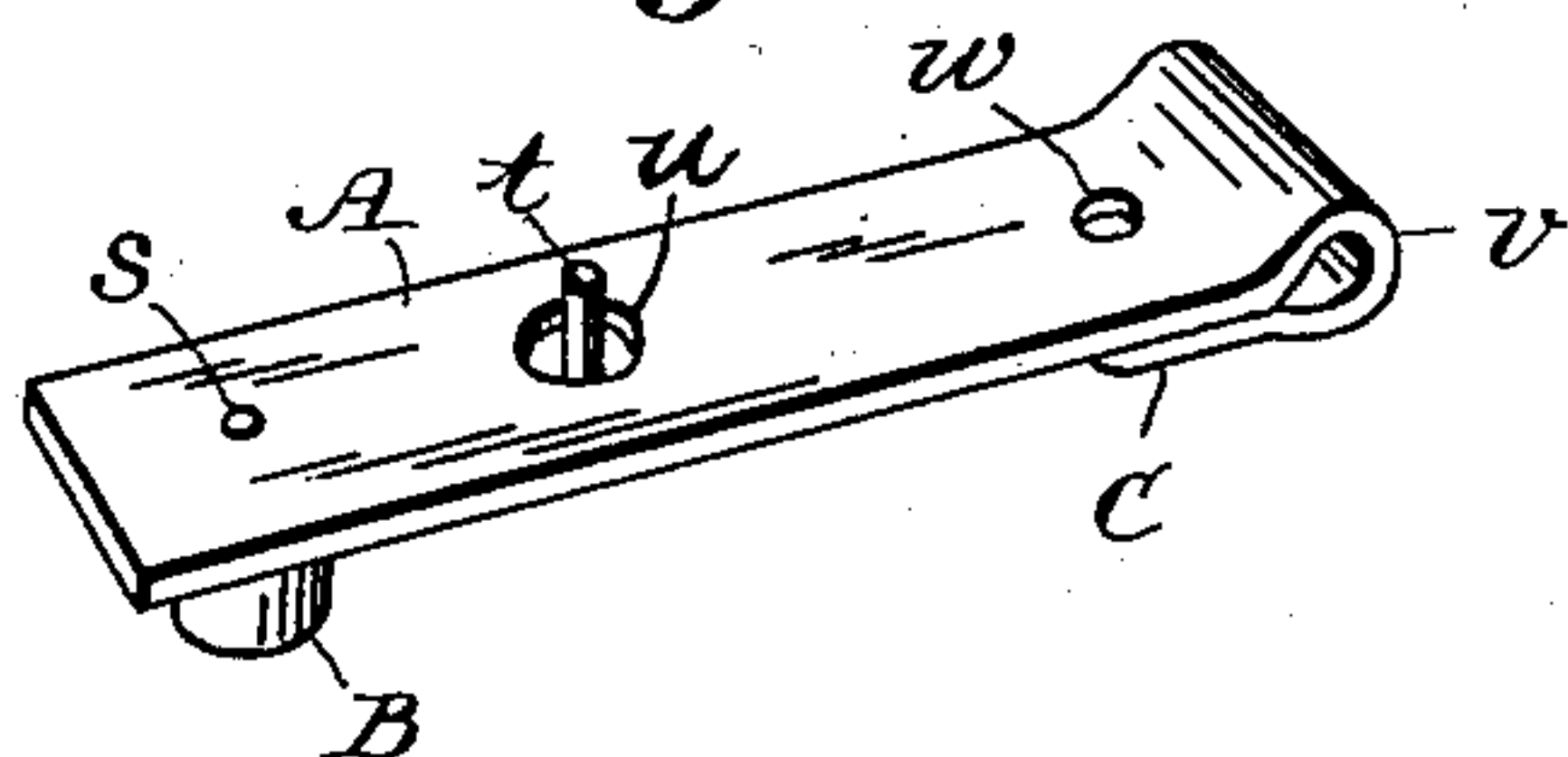
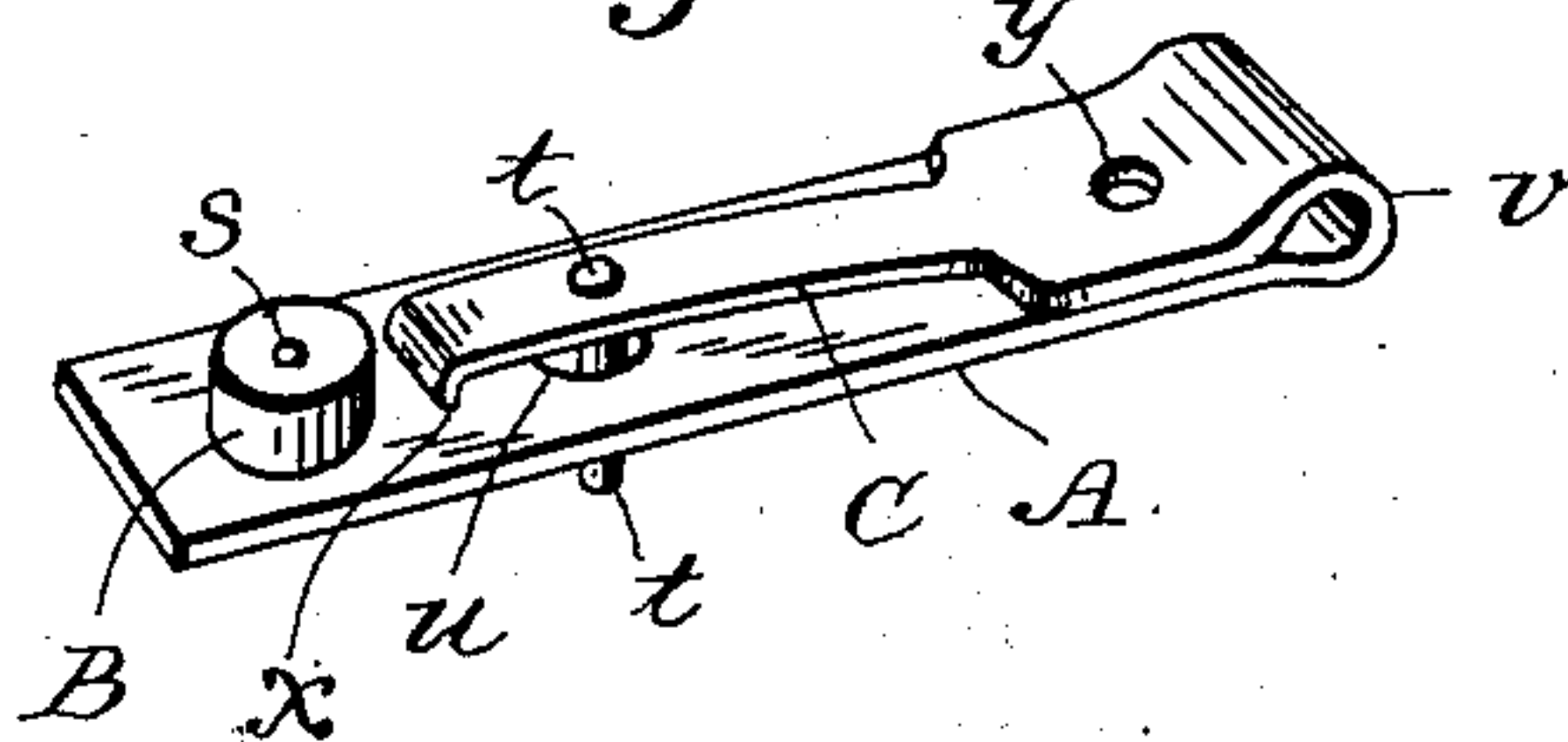


Fig. 4.



2 Witnesses:

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UNITED STATES PATENT OFFICE.

ARTHUR H. DEISHER, OF FRANKTON, INDIANA, ASSIGNOR OF ONE-HALF
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CIRCUIT-BREAKER FOR JUMP-SPARK COILS.

SPECIFICATION forming part of Letters Patent No. 736,703, dated August 18, 1903.

Application filed April 13, 1903. Serial No. 152,347. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR H. DEISHER, a citizen of the United States, residing at Frankton, in the county of Madison and State of Indiana, have invented new and useful Improvements in Circuit-Breakers for Jump-Spark Coils; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in vibrators for electrical circuit-breakers, and refers particularly to the vibrator-springs, the object of the invention being to insure the breaking of circuits, and thus preventing the burning and adhesion of contact-points employed in circuit-breakers in connection with explosive-engines in which charges are exploded by means of electric sparks.

The invention consists in a novel double-spring vibrator or a vibrator comprising a circuit-spring carrying a contact-point and an armature-spring adapted to be magnetically attracted and to strike the circuit-spring repeated blows in breaking the circuit.

The invention consists also in the parts and the combination and arrangement of parts, as hereinafter particularly described and claimed.

Referring to the drawings, Figure 1 represents a central longitudinal sectional view of a case in which is a jump-spark coil of ordinary construction having my improved circuit-breaker connected therewith, which is shown in central section; Fig. 2, an end view of the case of the apparatus, showing a plan of the circuit-breaker; Fig. 3, a perspective view of the vibrator, showing the upper or outer side thereof; and Fig. 4, a perspective view of the vibrator, showing the lower or inner side thereof.

Similar reference characters in the several figures of the drawings designate like parts or elements.

In order that the invention may be clearly understood, a description will first be given of the well-known apparatus with which the invention is connected. The apparatus is usually supported by a case and partially in-

closed therein, *a* designating the back, *b* the front, and *c* and *d* the ends of the case, having suitable sides. In the case the coil *e* is suitably supported, the core *f* extending 55 through an aperture in the end *d*, and the condenser *g* is also situated in the case and the vacant spaces are filled with paraffin (not shown) after the wires have been arranged. Binding-posts *h* and *i* are attached to the end 60 *d*, and similar posts *j* and *k* are attached to the front *b*. An anchor-block *l* is secured to the outer side of the end *d* near the back *a*, and to the block it has been the practice to secure the ordinary vibrator-spring, which the 65 present invention displaces. The arch *n* has an adjustable contact-pin *p*, having a lock-nut *q*, and is secured also to the outer side of the end *d* of the case. One end 1 of the primary coil (not shown) is connected to the con- 70 denser and also has a branch 2 connected with the block *l*, the other end 3 being connected to the post *i*, from which a wire 4 extends to the condenser, a wire 5 connecting the arch *n* with the post *h*, as will be under- 75 stood. The opposite ends 6 and 7 of the secondary coil (not shown) are connected to the posts *j* and *k*. Wires 8 and 9, connected to the posts *h* and *i*, are designed to be connected with a battery, and wires 10 and 11, con- 80 nected to the posts *j* and *k*, are designed to be connected as the secondary circuit to the engine-cylinder.

The improved circuit-breaker as preferably constructed comprises a comparatively strong 85 plate-spring *A*, which is mounted on the block *l* and extends beyond the core *f*. A stop *m* is secured to the case, so as to be engaged by the spring *A*. An armature *B* is secured to the spring *A* at its under side near the free 90 end thereof, so as to be opposite the core *f*. A plate-spring *C*, which is relatively weaker than the spring *A*, is connected suitably to the spring *A* between the same and the block *l*, to which it is secured. If preferred, how- 95 ever, the spring *C* may alone be secured to the block *l* and directly support the spring *A*. In a simple form of construction the two springs may be composed of a single piece of metal, as shown and preferred, both plates 100 being secured together and to the block *l* by means of a screw *r*. The armature *B* is se-

cured to the spring A by means of a rivet *s*. The contact-point *t*, adapted to coöperate with the pin *p*, is secured to the spring C and extends through an aperture *u*, that is provided in the spring A. In forming the two springs of a single piece, when so preferred, a bend *v* is made at a suitable point in the piece, and the adjacent body portions are brought together adjacently to the bend, the part forming the spring A having an aperture *w*, and the part forming the spring C having an aperture *y* to receive the screw *r*. The end of the spring C is bent slightly toward the spring A, and normally the two springs stand apart, the spring A against the stop *m* and the point *t* against the pin *p*. The spring C is preferably narrower than the spring A, and it is an electrical conductor, as will be obvious.

The stop *m* is an inexpensive and simple device for limiting the reverse movements of the armature B and preventing excessive vibratory movements of the spring A, that carries the armature. In employing the stop an extremely fine and expensive adjustment of the tension of the spring A is not required. The stop obviously may be situated in various positions, providing that it may be normally engaged by the spring A and hold the armature B within the influence of the core *f* or electromagnet. The tension of the spring A should normally carry the armature away from the magnet, which movement is limited by the stop.

It will be understood that the spring A may be bent laterally, so as to avoid interfering with the contact-point *t*, in which case it will not have the aperture *u* therein. Also while it is necessary that the circuit-spring C be in electrical connection, as by means of the block *l*, the armature-spring A may be suitably supported independently of the spring C and the block *l* at some adjacent point, and it may be of various shapes so long as its end having the armature is arranged so as to strike the spring C intermittently and so that the armature may be acted on by the electromagnet or core *f*.

In practical use, according to design, the current will pass through the contact-points *p* and *t*, and the armature B, being drawn to the core *f*, will draw the spring A also in such manner as to strike the end of the spring C intermittently with considerable force, the impacts being sufficient in intensity to break away the point *t* from contact with the end of the pin *p*, thus suddenly and effectively breaking the electrical circuit intermittently, the result of which will be to prevent the sticking of the point *t* to the pin *p*, and thus avoid burning of the contact-points when the current may be too strong.

Having thus described my invention, what I claim is—

1. An electrical circuit-breaker including a fixed contact-pin, a circuit-spring having a contact-point opposite the contact-pin and

suitably supported, an electromagnet, a relatively strong armature-spring suitably supported adapted to coöperate with the electromagnet and also with the circuit-spring, and a stop normally engaging the armature-spring.

2. An electrical circuit-breaker including a fixed contact-pin, a fixed anchor-block, a fixed stop, a relatively weak circuit-spring supported by the anchor-block and having a contact-point normally engaging the contact-pin, an electromagnet situated in a plane between the anchor-block and the stop, a relatively strong armature-spring supported by means of the anchor-block extending beyond the ends of the circuit-spring in proximity thereto and beyond the electromagnet and normally engaging the stop, and an armature attached to the armature-spring opposite to the electromagnet.

3. In a circuit-breaker for jump-spark coils, the combination with the core of the coil, and with the fixed contact-pin, of a circuit-spring suitably supported and in electrical circuit and having a contact-point adapted to engage the contact-pin, an armature-spring suitably supported and having an aperture through which the contact-pin extends, the armature-spring extending across the end of the core oppositely thereto and adapted to coöperate therewith, and a stop normally engaging the armature-spring.

4. In a circuit-breaker for jump-spark coils, the combination with an electromagnet and with a fixed contact-pin, of an anchor-block in circuit connection, a circuit-spring secured to the anchor-block and having a contact-point adapted to engage the contact-pin to complete the circuit, an armature-spring integral with the circuit-spring and having an aperture through which the contact-pin extends, an armature secured to the armature-spring oppositely to the electromagnet and adapted to coöperate therewith and cause the contact-spring to be struck intermittent blows to break the circuit through the circuit-spring, and a stop normally engaging the armature-spring.

5. In a circuit-breaker for jump-spark coils, the combination with an electromagnet and with a fixed contact-pin, of a vibrator comprising a circuit-spring and a relatively stronger armature-spring formed as integral parts and suitably supported, the circuit-spring having a contact-point adapted to coöperate with the contact-pin, and the armature-spring adapted to coöperate with the circuit-spring and having an armature adapted to coöperate with the electromagnet, and a stop adapted to be engaged by the armature-spring.

6. In a circuit-breaker for jump-spark coils, the combination with an electromagnet and with a fixed contact-pin, of an armature-spring having an aperture therein and suitably supported, an armature attached to the armature-spring opposite to the electromag-

net, and a circuit-spring suitably supported and having a contact-point extending through the aperture of the armature-spring opposite to the contact-point.

- 5 7. In a circuit-breaker for jump-spark coils, the combination with the case having the anchor-block, the electromagnet and the fixed contact-pin, of a vibrator comprising a plate bent over upon itself and forming an armature-spring having an aperture in the body
10 portion thereof and a relatively narrow circuit-spring having the end thereof bent toward the armature-spring, the vibrator being secured to the anchor-block, a contact-

point attached to the circuit-spring near the
15 end thereof extending through the aperture in the armature-spring, an armature attached to the armature-spring opposite to the electromagnet, and a stop secured to the case at the end of the armature-spring in proximity
20 thereto.

In testimony whereof I affix my signature in presence of two witnesses.

ARTHUR H. DEISHER.

Witnesses:

WM. H. PAYNE,
E. T. SILVIUS.