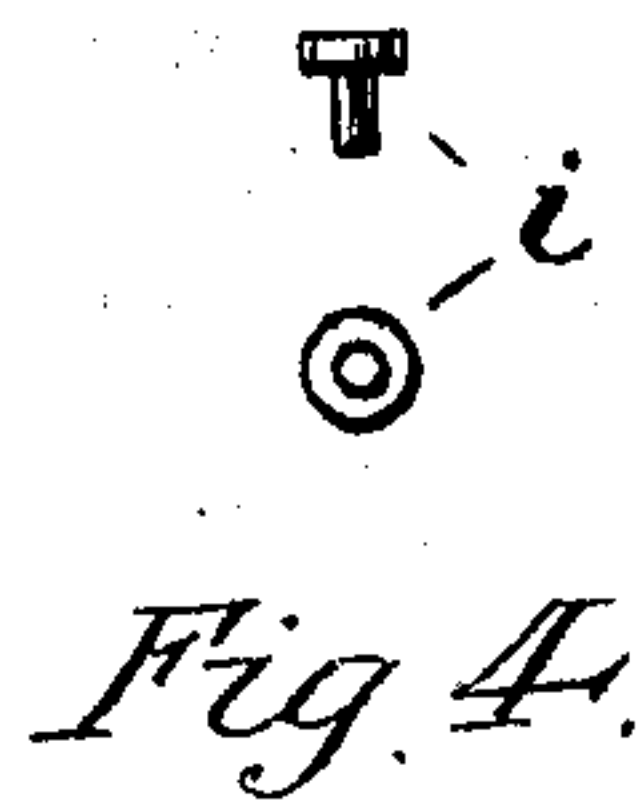
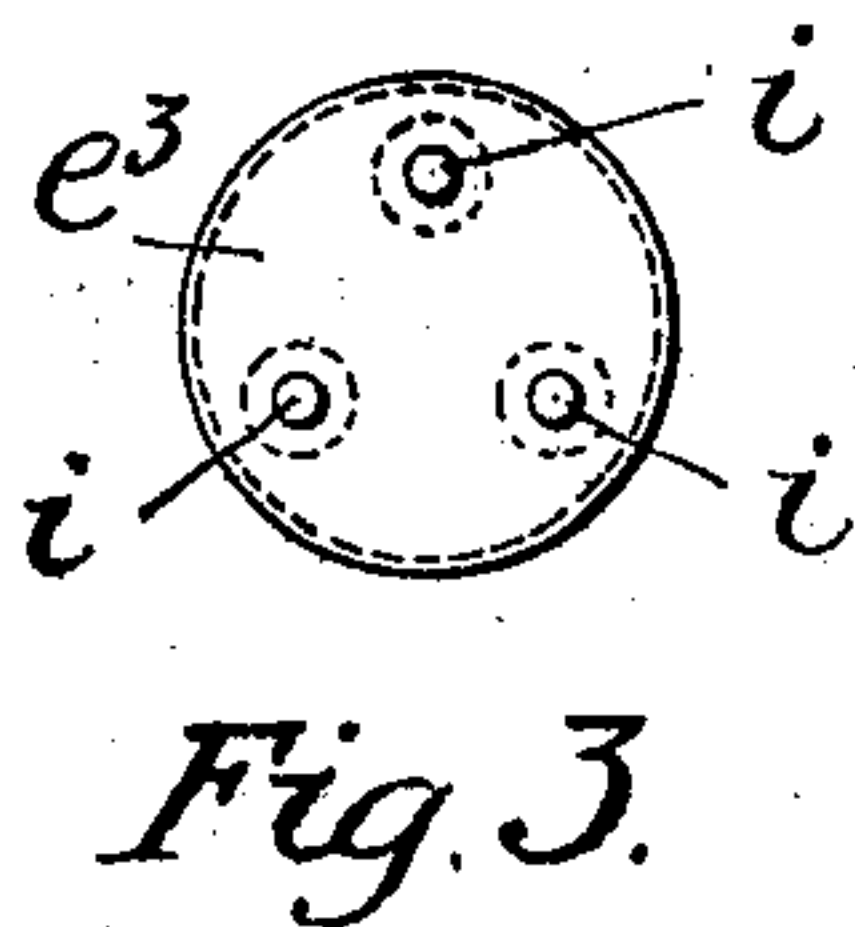
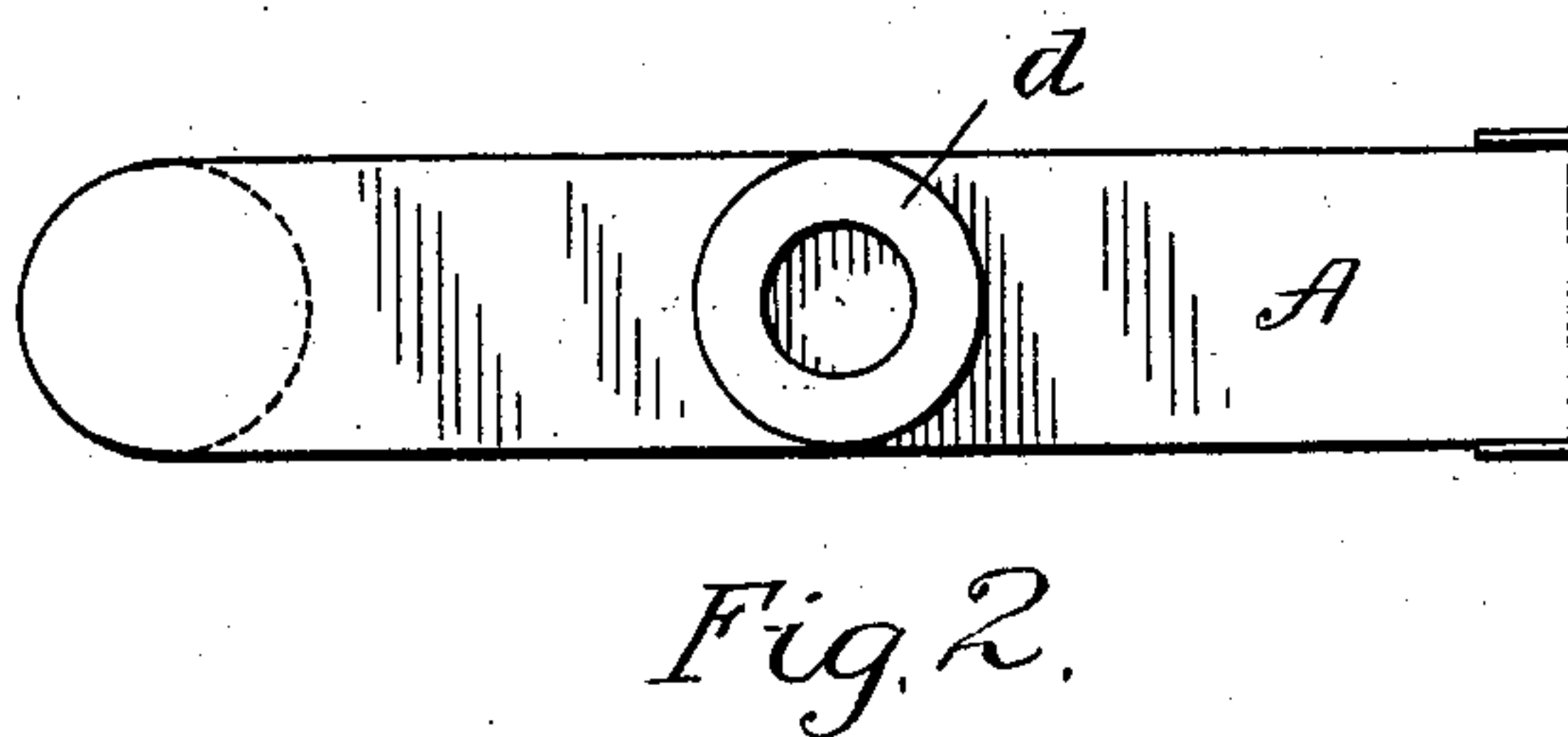
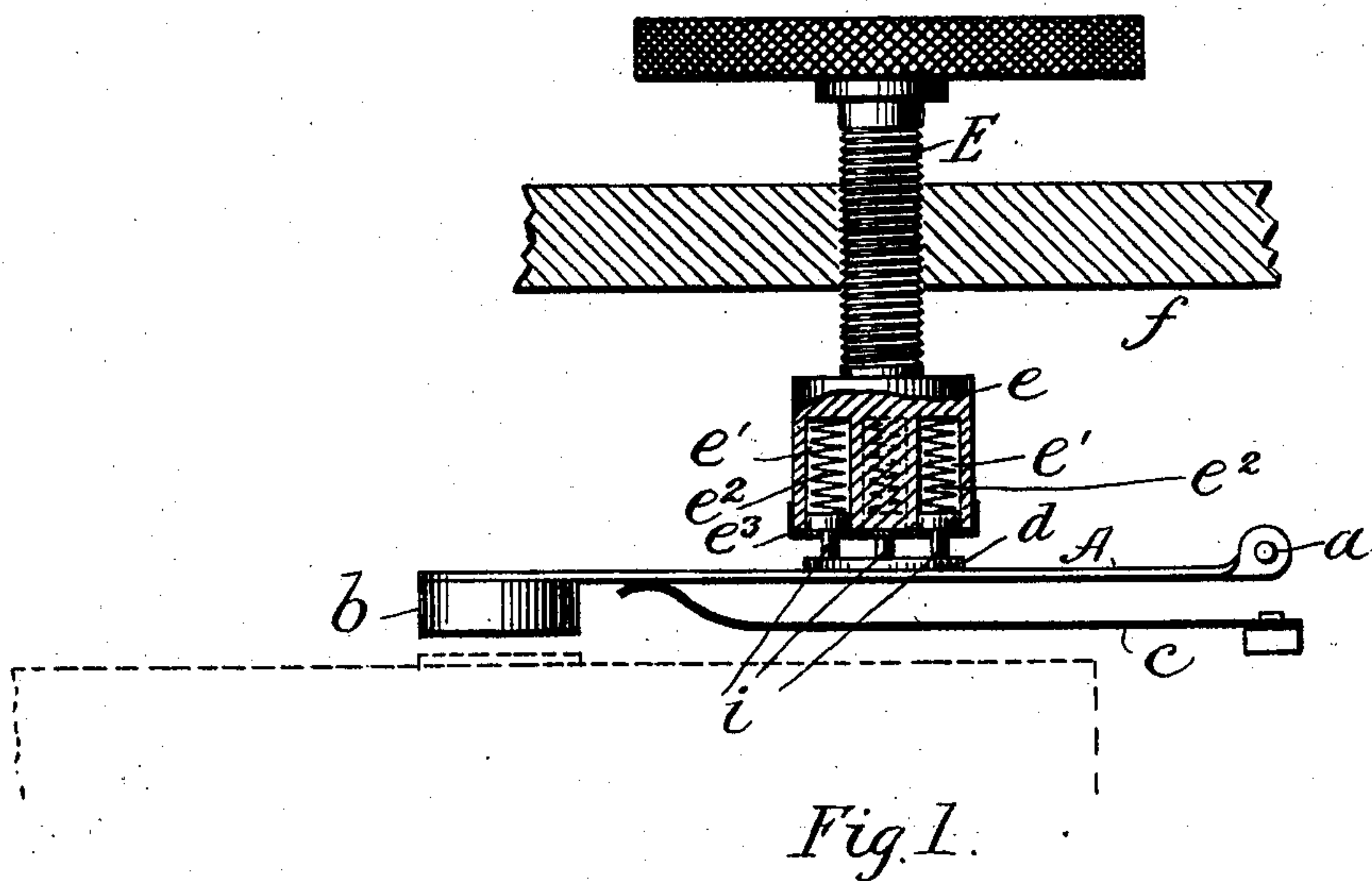


No. 750,040.

PATENTED JAN. 19, 1904.

R. VARLEY.
VIBRATORY CIRCUIT CONTROLLER.
APPLICATION FILED OCT. 19, 1903.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

RICHARD VARLEY, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO
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VIBRATORY CIRCUIT-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 750,040, dated January 19, 1904.

Application filed October 19, 1903. Serial No. 177,519. (No model.)

To all whom it may concern:

Be it known that I, RICHARD VARLEY, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Vibratory Circuit-Controllers, of which the following is a full, clear, and exact description.

This invention relates to vibrating contacts for induction-coils, electric bells, and other electrical devices where the electric current is rapidly interrupted. The improved device is a refinement of the usual contacts, affording certainty and reliability of action, such being especially desirable in the operation of spark-coils.

My invention consists, essentially, of a vibrator adapted to actuate a plurality of contacts or pairs of contacts whereby a fault productive of a high resistance at one or more of the contacts will not incapacitate the device. Further, while the current will on closed circuit normally be distributed equally across the total number of contacts any one of them will be of sufficient capacity to carry the full current, and since the contacts are individually spring-mounted one of them is sure to establish the circuit, even if all of the others are prevented from doing so.

The invention will be described in detail with reference to the accompanying drawings, in which—

Figure 1 is a side elevation, partially in section, of my improved vibrator. Fig. 2 is a plan of the armature-lever. Fig. 3 is a plan of the bottom plate of the contact-carrying screw, and Fig. 4 shows two views of one of the contacts.

A is an armature-lever, preferably of rigid material, pivoted at *a* and carrying a soft-iron armature *b*, which stands in front of the core of an induction-coil or electromagnet. (Indicated by dotted lines.) This lever is normally pressed away from the pole by a spring *c*. On the back of the armature-lever is secured a ring or disk of platinum *d*, constituting a contact surface or anvil for the plurality of contact-points, to be referred to.

E is an adjusting-screw having a milled

head for manipulation between the thumb and finger and working in a bridge or other frame *f*. The inner end of this screw is provided or formed with a cylindrical block *e*, having a plurality of cavities *e'* arranged therein, with their axes parallel to the axis of the screw. Three of such cavities are shown. Each of them contains a light spring *e''*, and all of them are closed at the lower ends by a cap *e'''*, forced or threaded over the end of the block. This cap is provided with small openings registering with each of the cavities *e'*, and through these openings project the contact-pins *i*, having heads within the cavities and pressed upon by the springs therein. The pins project uniform distances through the cap and normally rest evenly against the platinum ring or disk *d*, being held in good contact therewith both by the common spring *c* and the individual springs *e''*. The tension of the spring *c* is sufficient to slightly overcome the combined tensions of the springs *e''*, so that normally the pins are forced slightly into their respective cavities. The pins are platinum-tipped to withstand the arcing that ordinarily takes place.

The circuit controlled by this vibrator leads from the armature-lever A, and at the ring *d* it divides, passing equally through the various pins *i*, then to the metal parts with which the pins are in contact, to the screw and frame. In operation when the armature-lever is attracted toward the magnet-pole the circuit is broken simultaneously between all three of the pins and the ring *d*, whereupon spring *c* returns the armature-lever, and contact is made simultaneously with all of the pins. A repetition of this operation produces the usual vibratory action. In case a particle of dust falls between any pin and the ring the tension of spring *c* is sufficient to force that particular pin farther into its cavity to compensate for the space occupied by the foreign particle, and thus establish contacts between the other two pins and the ring which are sufficient to carry the current. In fact, if foreign particles settle between all of the pins except one and the ring, spring *c* will still be strong enough to establish contact with the

one remaining pin. Thus it will be seen that with three of the independently mounted and yielding pins almost absolute certainty of action can be expected of the device. It is desirable to use either a ring or disk, preferably the former, with which all of the pin-contacts may collide, because in the adjusting of the distance between the ends of the pins and the armature-lever the screw E is turned and changes the angular position of the pins. This fact of the rotation of the screw is another element of security, since it brings each pin-point opposite a fresh portion of the ring.

Having described my invention, I claim—

1. A vibratile contact device for electric circuits, consisting of two members, one of which is vibratory and the other fixed, one of them carrying a plurality of contacts adapted to engage with the other and a circuit in which said plurality of contacts are connected in parallel relation.

2. A vibratile contact device for electric circuits, consisting of two members, one of which is vibratory and the other fixed one of them carrying a plurality of independently-mounted contacts adapted to engage with the other and a circuit in which said plurality of contacts are connected in parallel relation.

3. In a vibrating circuit-controller, a vibratory element in combination with a fixed element, the latter carrying a plurality of spring-mounted pins facing up and adapted to contact with the vibratory element.

4. In a vibrating circuit-controller, the combination of an armature-lever, a spring tending to retract the same, and a back contact consisting of a plurality of independent pins and

springs acting independently upon the pins in opposition to the spring acting upon the armature-lever, substantially as described.

5. In a vibrating circuit-controller, the combination of a vibratile element having a circular contact-surface and a plurality of fixed contacts arranged in a circle and adapted to make simultaneous connections with said circular contact-surface.

6. A vibrating circuit-controller consisting of a vibratile element provided with a circular contact-surface in combination with a contact-carrier provided with a plurality of contact-points arranged in a circle thereon and adapted to make contact with said circular surface, and means for rotating said contact-carrier.

7. In a vibratory circuit-controller, the combination of a vibrating element provided with a circular contact-surface, an adjusting-screw carrying a plurality of contacts arranged in a circle concentric with and adapted to engage said circular surface, substantially as described.

8. In a vibrating circuit-controller, a thumb-screw provided with an enlargement at its inner end, a plurality of cavities in said enlargement, a spring in each cavity, a perforated cap covering all of the cavities, contact-pins projected through the cap by the springs and an armature-lever with which all of said pins make contact.

In witness whereof I subscribe my signature in presence of two witnesses.

RICHARD VARLEY.

Witnesses:

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WILLETT CHADWICK.