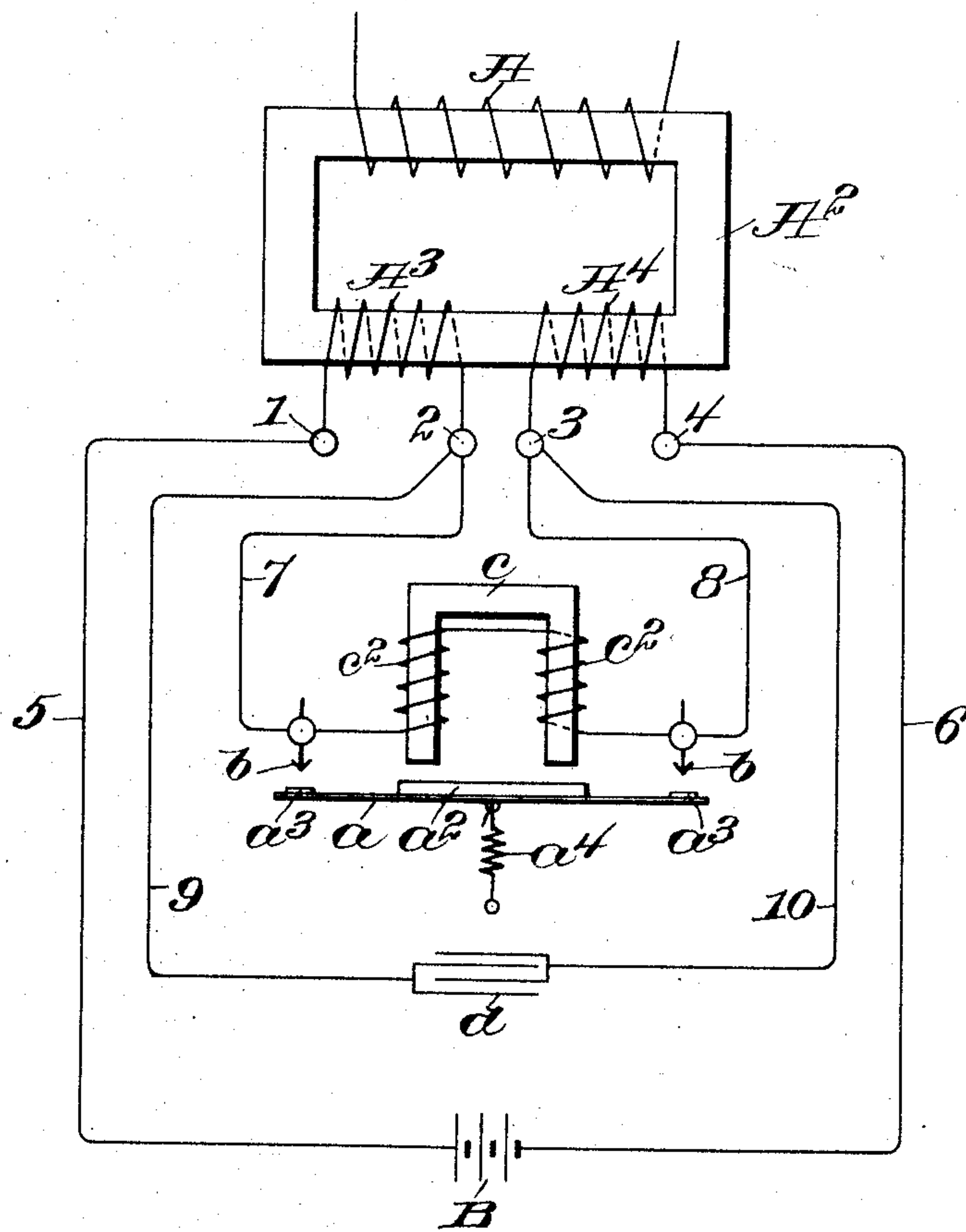


No. 886,443.

PATENTED MAY 5, 1908.

E. M. TORMIN.
VIBRATOR.

APPLICATION FILED JAN. 23, 1908.



Witnesses:
Jas. J. Maloney
J. J. [Signature]

Inventor:
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Attys.

UNITED STATES PATENT OFFICE.

EGMONT MAX TORMIN, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO HOLTZER-CABOT ELECTRIC COMPANY, A CORPORATION OF MASSACHUSETTS.

VIBRATOR.

No. 886,443.

Specification of Letters Patent.

Patented May 5, 1908.

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To all whom it may concern:

Be it known that I, EGMONT MAX TORMIN, a subject of the Emperor of Germany, residing in Newton, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Vibrators, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a vibrator and is embodied in a vibrator for use with an induction coil.

The invention relates mainly to the arrangement of the circuits through the vibrator and the primary of the transformer whereby currents of great intensity can be handled without sparking at the vibrator terminals.

In accordance with the invention, the primary coil and the high resistance electro-magnetic coils which cause the vibration of the armature or vibrating member are in series, and a condenser is employed in parallel with this circuit, which is continually closed.

The deenergizing of the electro magnet to release the armature after the same has been attracted is caused by short circuiting the electro magnet coils which are necessarily of high resistance, the vibrating member serving as a low resistance path for the current after it has been attracted.

In the construction shown, the primary winding of the transformer is divided, and the electro-magnetic coils are located between the divisions of said winding while the conductors leading through the condenser are connected with the main circuit at points between the divisions of the primary winding and the electro-magnetic windings. In the preferred form, the arrangement is such that the low resistance shunt closed by the vibrating armature is broken at two points when the armature is released.

The drawing is a diagram of the circuits employed in accordance with the invention.

In the construction shown, the secondary coil A is wound on one side of a core A², the other side of which receives the primary winding A³, A⁴, the arrangement of which will be hereinafter described.

While the transformer is shown as provided with the rectangular core A², it is to be understood that other forms of transformer

may be employed without departing from the invention which relates mainly to the arrangement of circuits through the primary coil and the vibrator.

The primary coil is shown as divided into two sections A³ and A⁴, the terminals of the two windings being indicated as connected with binding posts 1, 2, 3 and 4. The binding post 1 is shown as connected by means of a conductor 5 with the positive terminal of the source of current B, while the binding post 4 is shown as connected by means of a conductor 6 with the negative terminal thereof. In order to change the steady flow of current from the battery B into an intermittent or pulsating current so as to induce a current in the secondary A, a vibrating circuit controlling member *a* is employed, the said vibrating member being connected with an armature *a*² and with contact members *a*³, such as platinum points arranged when the armature *a*² is attracted to be brought into contact with stationary terminals *b*. It is to be noted that, by this arrangement, the circuit controlled by the armature is broken at two points, this arrangement, while not essential, having practical advantages. The armature *a*² is in the magnetic field of an electro-magnet *c* energized by means of a high resistance winding *c*² which receives the current through conductors 7 and 8 connected, respectively, with the binding posts 2 and 3. The current flowing from the source B, therefore, passes through the primary winding A³, the magnetic coils *c*² and the primary winding A⁴ back to the battery, thus energizing the electro-magnet *c* and attracting the armature *a*².

The member *a*, which carries the contacts *a*³, is made of conducting material of sufficient size to afford comparatively slight resistance to the flow of current, it being obvious, therefore, that when the terminals *a*³ come in contact with the terminals *b*, the coils *c*² will be short circuited and the electro magnet *c* be deenergized. The member *a* is normally held out of contact with the terminals *b*, as by a spring *a*⁴, so that it will be withdrawn as soon as the electro magnet *c* becomes deenergized, the result being that this member will vibrate so long as current is flowing from the battery, while the battery current which passes through the primary winding of the transformer, will be changed from a direct to a pulsating current. In order to prevent

sparkling, a condenser *d* is employed, the said condenser being shown as connected by means of conductors 9 and 10 with the binding posts 2 and 3, the said condenser obviously being in multiple with the main battery circuit as well as with the circuit through the electro magnet *c*, and in a circuit which is permanently closed.

Claims.

10 1. In a vibrator, the combination with a secondary transformer winding; of a primary transformer winding divided into two coils; an electro-magnet the winding of which is in series with said coils and located between the same; and a vibrating circuit-controlling member in the field of said electro-magnet.

15 2. A source of current; a divided primary coil, the windings of which are connected respectively with the positive and negative

terminals of said source; an electro-magnet 20 the winding of which is in series with said primary coil and located between the divisions thereof; an armature in the field of said electro-magnet adapted when attracted to short-circuit said winding; and a con- 25 denser in multiple with said winding.

3. The combination with a primary transformer winding; of an electro-magnetic winding in series therewith, the circuit through said windings being permanently closed; and 30 a condenser in multiple with said circuit.

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

EGMONT MAX TORMIN.

Witnesses:

JAS. J. MALONEY,
M. E. COVENEY.