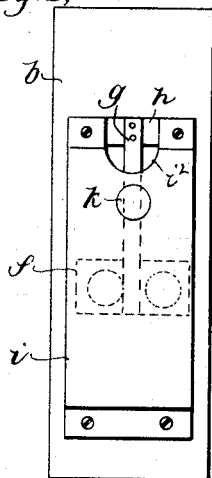


(No Model.)

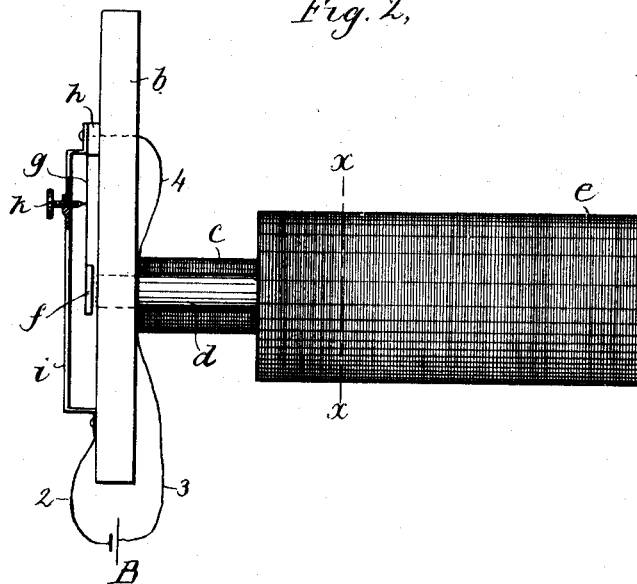
A. H. HOYT.  
INDUCTORIUM.

Patented Mar. 4, 1890.

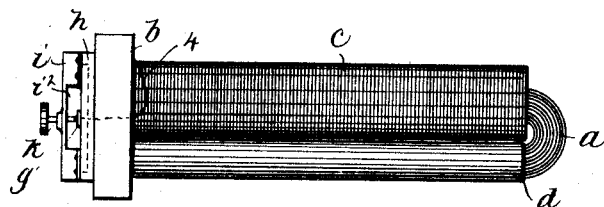
No. 422,885.  
*Fig. 1,*



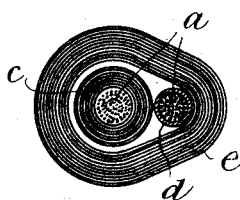
*Fig. 2,*



*Fig. 3,*



*Fig. 4,*



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Att'y.

# UNITED STATES PATENT OFFICE.

ADRIAN H. HOYT, OF MANCHESTER, NEW HAMPSHIRE, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO THE WHITNEY ELECTRIC MANUFACTURING COMPANY, OF COLUMBUS, OHIO.

## INDUCTORIUM.

SPECIFICATION forming part of Letters Patent No. 422,885, dated March 4, 1890.

Application filed July 24, 1889. Serial No. 318,498. (No model.)

*To all whom it may concern:*

Be it known that I, ADRIAN H. HOYT, of Manchester, county of Hillsborough, and State of New Hampshire, have invented an Improvement in Inductoriums, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

My invention relates to an inductorium of that class in which an automatic rheotome or vibrating circuit-breaker is included in the circuit of the primary coil, so as to produce the rapid changes in the condition of the current in the primary circuit by which the currents are induced in the secondary circuit.

The object of the invention is to make the vibrating circuit-breaker more positive and reliable in action than those commonly employed in apparatus of this kind.

The invention is embodied in an apparatus comprising a core shown as composed of a bundle of magnetic wires upon which the primary coil is wound, the said primary coil, however, extending from one end of said core somewhat less than half the length thereof and the said core being bent into a U shape, one branch of the U being within the primary coil, while the other branch is substantially parallel therewith, but at the outside of the primary coil. The second branch is inclosed in a brass tube or other non-magnetic shield, and the secondary coil is wound in such shape that it may be placed over the entire primary coil, and also that portion of the core of the primary coil which is inclosed in the shield. By this construction the two ends of the core of the primary coil are brought near one another, so as to constitute practically two poles of a horseshoe-magnet, which are employed to attract the armature of the rheotome, thus making said armature more positive in operation than when attracted only by a single pole, as has usually been practiced with apparatus of this kind in which the rheotome or vibrating armature is operated by the pole at one end only of the core. The secondary coil is, however, exposed mainly to the inductive effect of the primary coil and portion of the core contained therein.

The invention further consists in details of construction which will be hereinafter pointed out.

Figure 1 is a front elevation of an inductorium apparatus embodying this invention; Fig. 2, a side elevation thereof; Fig. 3, a plan view of the apparatus with the secondary coil removed; and Fig. 4, a transverse section on line *x x*, Fig. 2.

The core *a* of the inductorium is preferably composed of a bunch of iron wires bent into U shape, as best shown in Fig. 3, the ends thereof being inserted and securely held in a block or plate *b*, of insulating material. The primary coil *c* is wound upon one branch of the U-shaped core *a* and the other branch is inclosed in a tube *d*, of brass or other non-magnetic material, and the secondary coil *e* is wound to form an interior space capable of receiving within it both branches of the core *a*, with the primary coil *c* and tube *d* thereon, as best shown in Fig. 4, the secondary coil being capable of sliding longitudinally on the primary coil, so as to have a greater or less amount of the secondary coil exposed to the inductive action of the current in the primary coil.

In order to produce the rapid changes in the current of the primary coil, so as to maintain inductive action, a rheotome is introduced into the circuit of the primary coil and its battery B (see Fig. 2) or other source of electrical energy, the said rheotome comprising an armature or piece of soft iron *f*, supported on a spring *g*, itself fixed to a cross-bar *h*, of insulating material, supported on the block *b*. A metallic or electrically conducting plate *i* is also supported on the block *b*, being bent or shaped to inclose the armature between it and the block *b*, as shown in Figs. 1 and 2, and being provided with a recess *i*<sup>2</sup> (see Fig. 1) where the armature-spring *g* is connected with the bar *h*, so as to insulate the plate *i* from the armature and its supporting-spring *g* where the said plate and spring are connected with the bar *h*. The plate *i* is provided with an adjustable contact-piece *k*, which normally just touches the spring *g*, as shown in Fig. 2, thus electrically connecting the plate *i* and spring *g* when such

spring is not subjected to the action of an extraneous force.

The spring *g* and plate *i* or contact *k* of the latter constitute the terminals of the circuit that includes the primary coil *c* and battery B, one pole of said battery being connected, as shown at 2, with the plate *i*, and thus with the contact *k*, while the other pole of the battery is connected by wire 3 with one terminal of the coil *c*, the other terminal of which is connected by wire 4 with the spring *g*. Thus when the battery is connected in circuit its current passes through the primary coil *c* and magnetically energizes the core *a*, the poles of which attract the armature *f*, which thus strains the spring *g* away from the contact *k*, breaking the circuit at this point, and thus demagnetizing the core, so that the attractive force applied to the armature and acting on the spring *g* is removed and the said spring returns by its elastic force into contact with the piece *k*, when the current is again applied, the core energized, and the operation repeated, such action continuing as long as the battery is applied to the circuit and producing rapid vibrations of the armature with corresponding interruptions and re-establishments of the current in the primary coil. Such changes in the current in the primary coil produce currents in the secondary coil *e* by induction in the well-known manner, the strength or intensity of which induced currents depends upon the extent to which the secondary is advanced over the primary coil. The secondary coil may be provided with

terminals or electrodes of any suitable kind for utilizing the current produced in the said coil, and the apparatus is well adapted for use in generating electricity for medical purposes.

I claim—

1. An inductorium comprising a U-shaped core and primary coil upon one branch thereof and shield upon the other branch thereof, a secondary coil adapted to embrace the said parts combined with an armature co-operating with the poles of said core, and contacts operated by the said armature controlling the circuit of said primary coil, substantially as described.

2. The combination of the U-shaped core having the primary coil upon one branch and a shield upon the other branch thereof with a block of insulating material in which the ends or magnetic poles of said core are supported, an armature extending across both said poles and a supporting-spring therefor connected with said block, and a conducting-plate connected with said block with said armature between it and said block, said plate being provided with a contact-piece co-operating with the armature-supporting spring, substantially as and for the purpose described.

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

ADRIAN IL HOYT.

Witnesses:

JOS. P. LIVERMORE,

M. E. HILL.