

No. 861,117.

PATENTED JULY 23, 1907.

F. F. HESPE.  
ELECTROGALVANIC APPARATUS.  
APPLICATION FILED JULY 13, 1906.

Fig. 1.

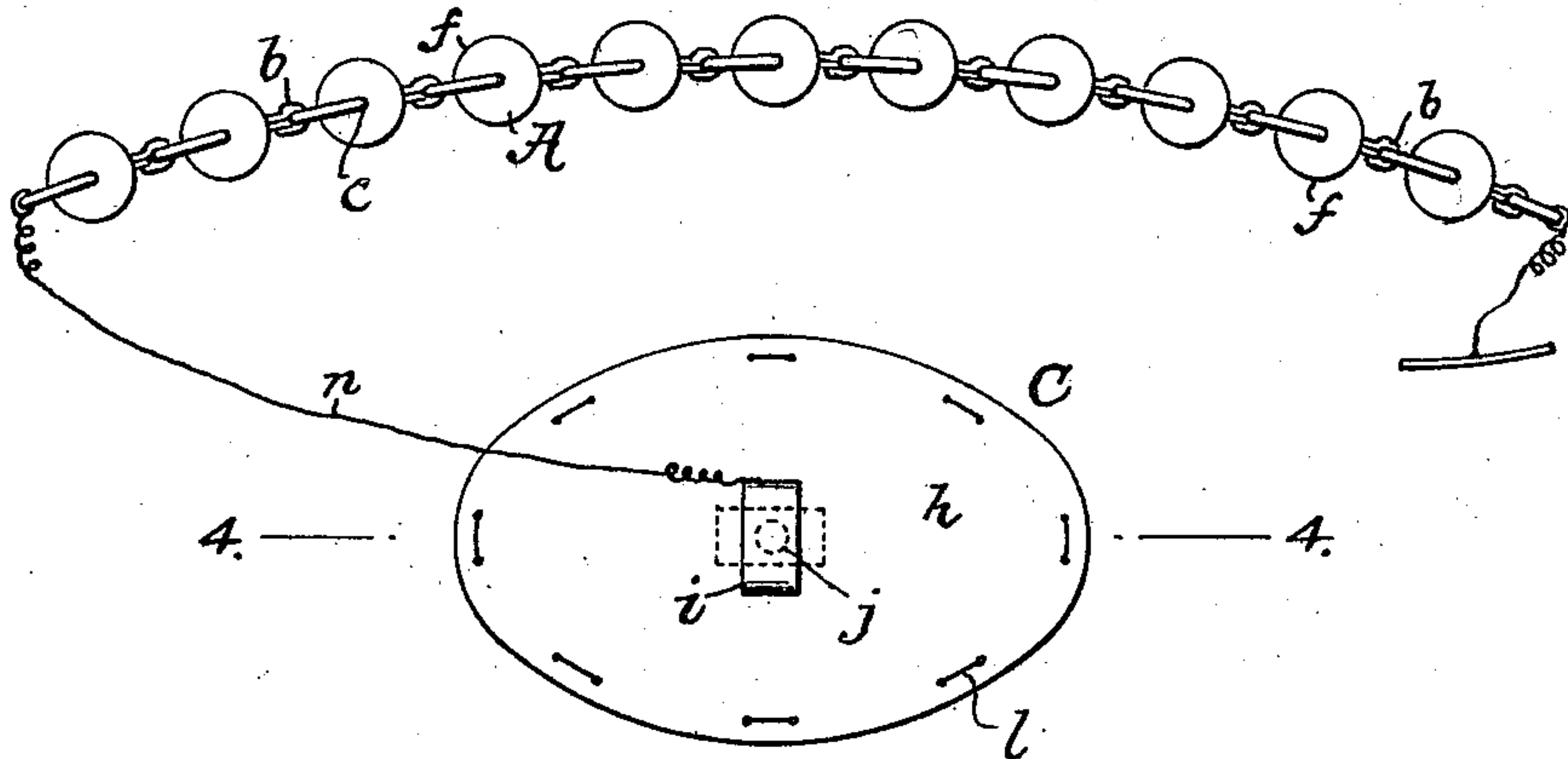


Fig. 3.

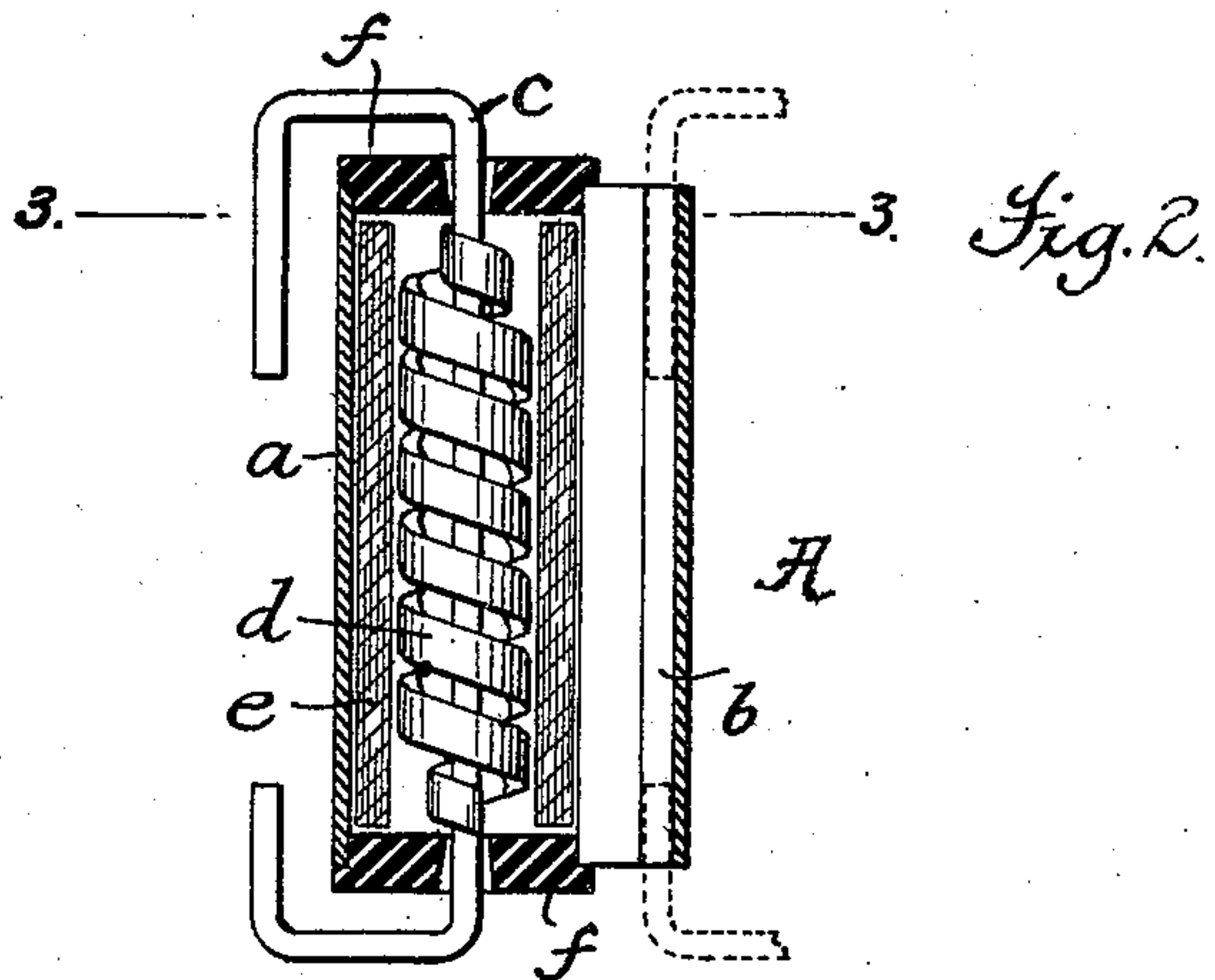
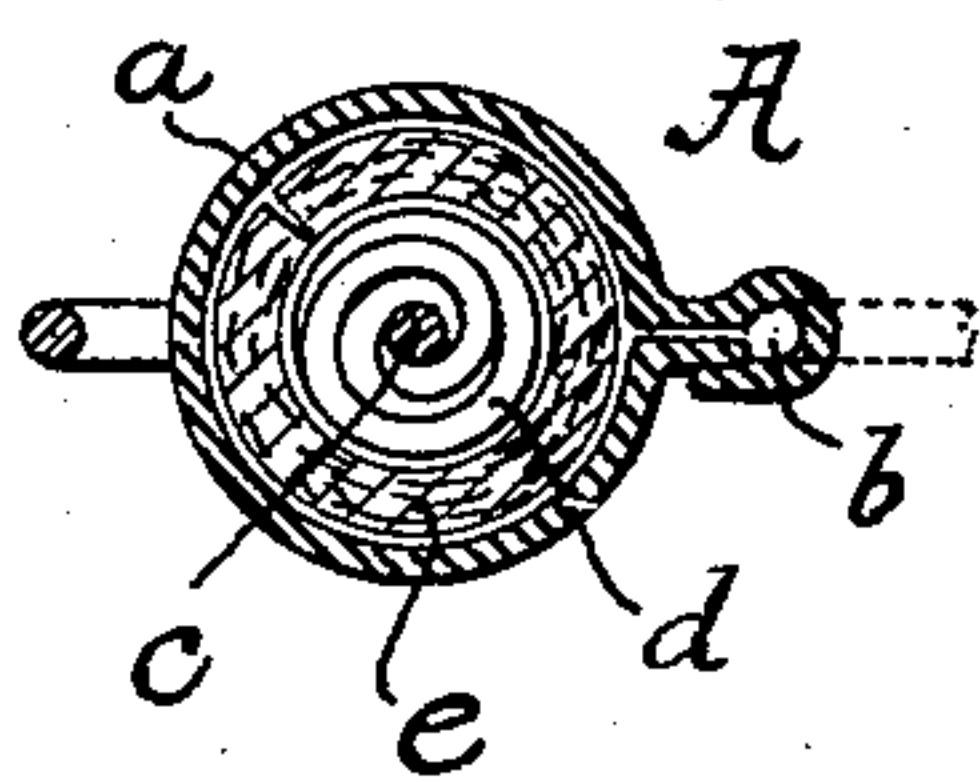
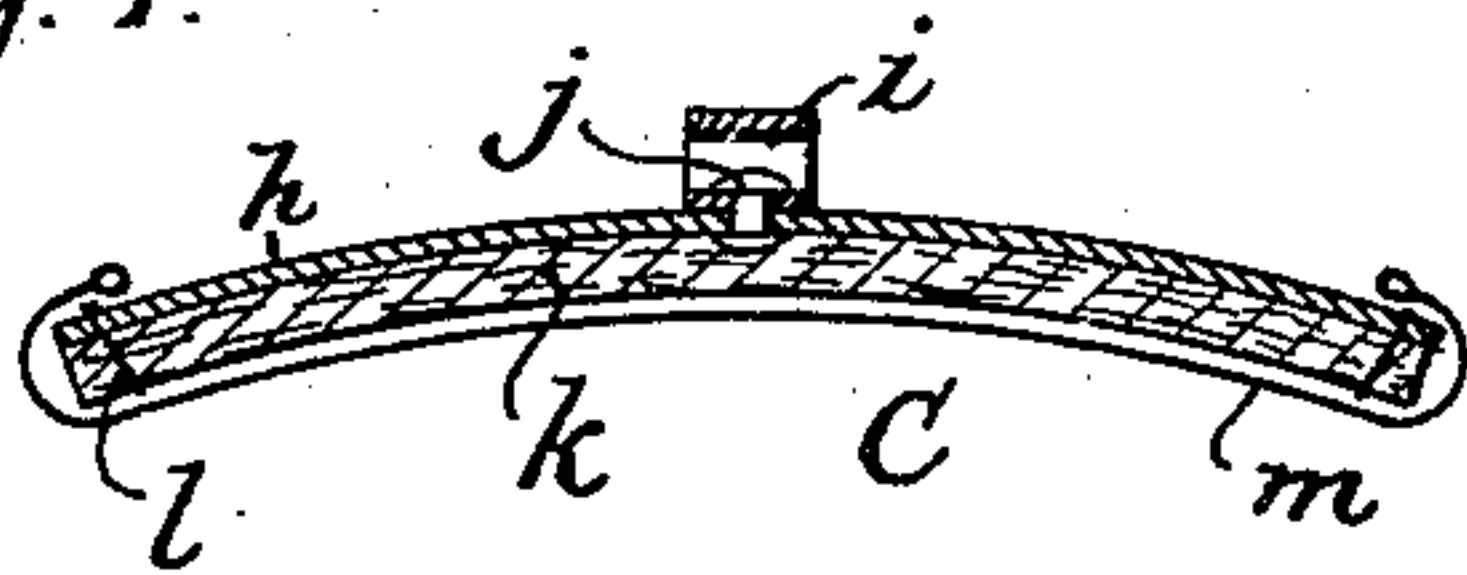


Fig. 4.



Witnesses:

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# UNITED STATES PATENT OFFICE.

FREDERICK F. HESPE, OF WEST HOBOKEN, NEW JERSEY.

## ELECTROGALVANIC APPARATUS.

No. 861,117.

Specification of Letters Patent.

Patented July 23, 1907.

Application filed July 13, 1906. Serial No. 326,105.

*To all whom it may concern:*

Be it known that I, FREDERICK F. HESPE, a citizen of the United States, residing at West Hoboken, Hudson county, State of New Jersey, have invented certain new and useful Improvements in Electrogalvanic Apparatus, of which the following is a specification.

The present invention relates to electro-galvanic apparatus such as is usually worn in the form of a belt on the person of the user for general or local application of currents of electricity.

It has for its object to improve the structure of such apparatus, to increase its efficiency and to render it possible to apply a current of electricity locally, together with the simultaneous application of some medicinal preparation or remedy.

The accompanying drawings illustrate a practical embodiment of the invention, in which:

Figure 1, is a diagrammatic view of a series of coupled galvanic cells together with a pad for the combined application of the electrical current and some medicinal preparation. Fig. 2, is an enlarged vertical sectional elevation of one of the improved cells. Fig. 3, is a cross section of the same on the line 3, 3 of Fig. 2. Fig. 4, is a central section of the pad taken on the line 4, 4 of Fig. 1.

The improved structure is usually applied to the body of the user in the form of a belt with the many cells A encircling, or partly encircling, the waist; the belt supporting the cells and the electric connections and switch not being shown, as such article is now well known.

Each of the cells A, is made up of a tubular portion *a* of sheet copper forming the outer electrode, the meeting ends of which are bent to lie flat against each other, with one of the ends longer than the other bent back to lap over the shorter end to form an eye *b*.

The inner electrode consists of a copper wire *c*, supporting the zinc strip *d*, which is coiled about the wire *c*, with its ends soldered thereto, as indicated in Figs. 2 and 3. The zinc strip is coiled in the form of a loose spiral so that the wire occupies a central position with respect to the zinc coils with an open space therebetween, and also with a long helical space between the adjacent portions, or coils, so that the acidulated liquid employed with the electrodes may freely enter axially of the zinc spiral coils and pass thence through the helical spaces.

Around the spiral zinc strip is wound a piece of felt *e*, or other similar material which fills the space between the zinc and the walls of the cell or outer electrode so that the acidulated liquid absorbed by the felt is in surface contact with both electrodes.

The top and bottom openings of the cell-shaped electrode *a*, are closed by a plug *f* of hard rubber, or other non-conducting material, the central wire *c* supporting the zinc coil, passing loosely through a central

hole in each plug. The ends of the zinc-supporting wire are then bent to engage the eye *b* of the adjacent cell as indicated by the dotted lines in Fig. 2, and may be secured therein by solder, or other means.

When the ends of the zinc-supporting wire *c* are fixedly secured to the eye of the adjacent cells, as by solder, the necessary hinged play between the cells to allow the whole connected series of cells to readily conform to the body of the wearer is had by the axial movement of the wire and zinc coil with respect to the surrounding cell containing said coil, as will be apparent.

By forming the zinc electrode of a narrow strip of that metal and spirally coiling it about its central support a larger surface of zinc is provided and the necessary spaces are provided for the free entrance of the acidulated liquid axially through the central holes of the plugs *f* to the interior of the zinc coils and thence through the helical space to the absorbent felt to thoroughly dampen it.

The pad C for the simultaneous local application of some medicinal preparation and the current of electricity is formed by a metal backing, or plate, *h*, with a rectangular shaped loop *i*, fastened to the plate *h* by a rivet *j*, adapting the loop for swiveling about its fastening to permit the strap by which the plate is secured to some part of the person of the wearer to adapt itself to the necessities of its application. The backing, or plate, *h*, carries, or is faced on one side with a pad *k*, of some liquid absorbing material such as soft felt which may be fastened by stitches of thread or silk *l* to the plate, so that a pad of felt containing one medical preparation may be easily substituted by another pad carrying, or containing, a different preparation or remedy, and the whole may be protected by a removable covering *m* to prevent the direct contact of the wearer's flesh with the medical preparation or remedy.

The pad C may be connected with the cells of the belt by a wire connection *n*, extending from one end of the series of cells to the loop *i* of the pad.

What is claimed is:

1. The hereindescribed galvanic cell composed of a tubular outer metallic electrode, an inner electrode consisting of a metallic strip loosely coiled about a supporting wire, providing a space between the inner surface of the strip and the wire open to the helical space between the coils, the free ends of the wire forming the connection with an adjoining cell, and a liquid absorbent between the two electrodes.

2. An electro-galvanic belt made of a connected series of cells each composed of a tubular outer copper electrode, an inner electrode consisting of a zinc strip spirally and loosely coiled about a supporting wire and providing a space between the inner surface of the strip and the wire open to the helical space between the coils, the free ends of which wire are bent over and connected to the adjacent tubular copper electrode, and a strip of felt interposed between the two electrodes.

3. A galvanic cell composed of a tubular sheet metal  
electrode with open ends, an interior zinc electrode formed  
of a strip spirally and loosely coiled about a central sup-  
porting wire and providing a space between the inner sur-  
5 face of the strip and the wire open to the helical space be-  
tween the coils, said wire with its ends adapted to form a  
connection with an adjoining cell, a sheet of felt wound  
around the spiral zinc coil and between it and the tubular  
cell-forming electrode, and non-conductor plugs in the ends  
10 of the tubular electrode having central openings for the

passage of the ends of the wire and allowing the free end  
entrance of the acidulated liquid to the felt.

In testimony whereof, I have signed my name to this  
specification in the presence of two subscribing witnesses,  
this 6th day of July 1906.

FREDERICK F. HESPE.

Witnesses:

GEO. H. GRAHAM,  
S. EDGAR DYE.