

I. L. PULVERMACHER.
VOLTA ELECTRIC APPLIANCE.

No. 177,276.

Patented May 9, 1876.

Fig. 1.

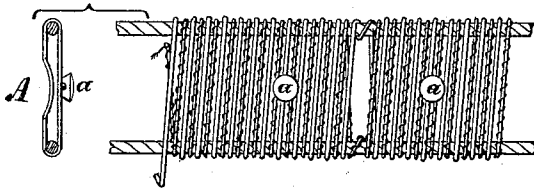


Fig. 2.

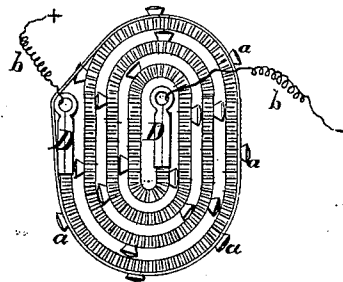


Fig. 3.

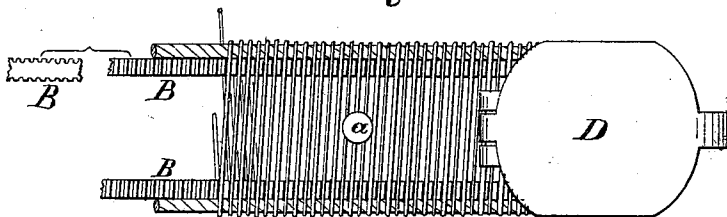


Fig. 4.



Fig. 5.

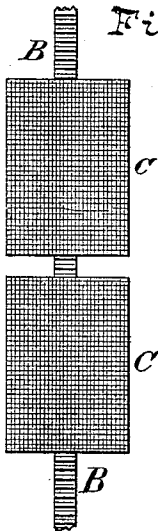


Fig. 6.

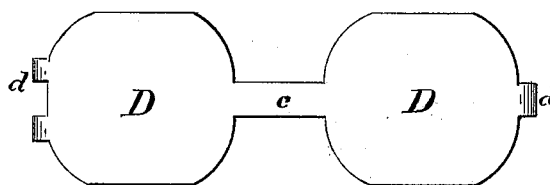


Fig. 7.

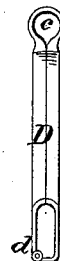


Fig. 8.

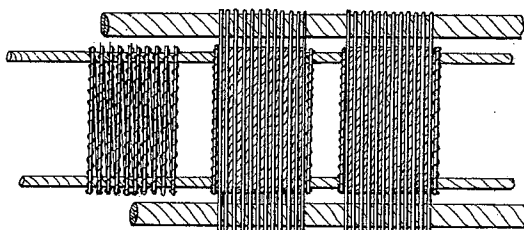


Fig. 9.



ATTEST

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UNITED STATES PATENT OFFICE.

ISAAC L. PULVERMACHER, OF LONDON, ENGLAND, ASSIGNOR TO JOHN EDWARD HETHERINGTON, OF CINCINNATI, OHIO.

IMPROVEMENT IN VOLTA-ELECTRIC APPLIANCES.

Specification forming part of Letters Patent No. **177,276**, dated May 9, 1876; application filed March 14, 1876.

To all whom it may concern:

Be it known that I, ISAAC LOUIS PULVERMACHER, of London, England, have invented certain Improvements in Volta-Electric Appliances, of which the following is a specification:

This invention has for its object the construction of volta-galvanic elements in the general form of belts or bands; and it consists partly in providing the belt with insulating-buttons and a groove to receive them when the belt is coiled; partly in providing the belt with gutta-percha bands or cords to separate the wires; partly in the construction and arrangement of pole-plates; and partly in the general construction of the parts, as will be hereinafter described.

In the drawings, Figure 1 shows a belt formed by spinning alternate strands of copper and insulated-zinc wire upon edge cords, to form a belt or band, the back of the band being indented longitudinally to form a groove, A. Along the other face of the belt, at intervals, are attached studs or buttons *a a* of some insulating material, so arranged that when the belt or band is rolled up, as in Fig. 2, the said buttons engage the groove A, thereby insulating the several coils, and serving to prevent the central portion from falling in when the coil is lifted. The studs also facilitate the attachment of a porous fabric to that side of the band or elements, so that when it is laid flat upon the body and worn next to the skin, wet conduction can be established without giving cause to derived currents within the battery. Another improvement in these bands consists in dispensing with spiral-thread coverings for one of the wires, and forming the isolation of one wire from the next of each element by strips or cords B B, of gutta percha, arranged in the hollows, such strips having grooves or recesses formed by the wires themselves during the spinning operation, thereby lodging in the grooves permanently, and being kept at a distance apart and from contact with each other, as shown in Figs. 3 and 4.

Fig. 5 shows a strip or cord, B, of gutta percha, similarly grooved as in Fig. 3, with pieces of some fibrous absorbent material C C—as felt or flannel—attached, said pieces

corresponding in width with each of the elements, so that when embraced by the elements they serve to maintain the action by absorbing the exciting-fluid, and also keep the wires apart. In addition, they serve to protect the wires against false contact.

The band when rolled up, as in Fig. 2, forms a voltaic battery when charged by dipping and then withdrawing it from the exciting-fluid. It is without loss of electricity by derived currents, and at the same time allows free access of the exciting-fluid and atmospheric air for depolarizing action.

To each end of the coil is secured a pole-plate, D, for attaching the conducting-wires *b b*. These plates are shown in an open and folded state, respectively, in Figs. 6 and 7, in which D D represent the cheeks of the plate, connected by a tie, *c*, and provided with hinge-loops *d d*. The cheeks are folded together, (Fig. 7,) the tie *c* forming a loop by which to attach the conducting-wire, and the hinge-loops receiving a pin which serves to attach the pole-plate to the belt or band. When constructed in this manner the cheeks of the pole-plate embrace the end of the belt, as in Figs. 2 and 3.

By attaching conducting-wires, as shown, to the ends of the coil, a current can be employed while the coil is inclosed in a box or bag of water-proof material. A rubber band may, for convenience, be stretched around the coil to hold it in a compact form as a voltaic battery.

In Figs. 8 and 9 is shown a modification of the construction of the belt or band, in which naked copper wire is spun upon edge cords, and thread-coated zinc wire spun upon smaller edge cords placed closer together and within the convolutions of the copper wire.

As in the form before described, a tissue of open woven fabric may be substituted for the thread-covering of the zinc wire, to isolate the positive inner from the negative outer wire.

I have already obtained a patent for the within-described invention in Great Britain, which patent bears date November 16, 1874, No. 3,937.

I claim—

1. Voltaic bands formed of wire spun upon

edge cords, and having upon one face a series of insulating-buttons, placed at intervals, and provided with a groove or indentation, A, in the other face, as and for the purposes herein set forth.

2. In the construction of voltaic bands, formed of wire spun upon edge cords, the gutta-percha strips or cords B B, as and for the purposes set forth.

3. In the construction of voltaic bands, formed of wire spun upon edge cords, the arrangement of two gutta-percha cords or strips, B B, near the said edge cords, and a third at the center or near the center of the width of the belt bearing pieces of porous absorbent

material C C, substantially as and for the purposes set forth.

4. The pole-plate, substantially as herein shown, consisting of two cheeks, D D, a tie, e, and suitable hinge-loops *d d*, adapted to be folded, as in Fig. 7, and secured to the end of the band, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two witnesses.

ISAAC LOUIS PULVERMACHER.

Witnesses:

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