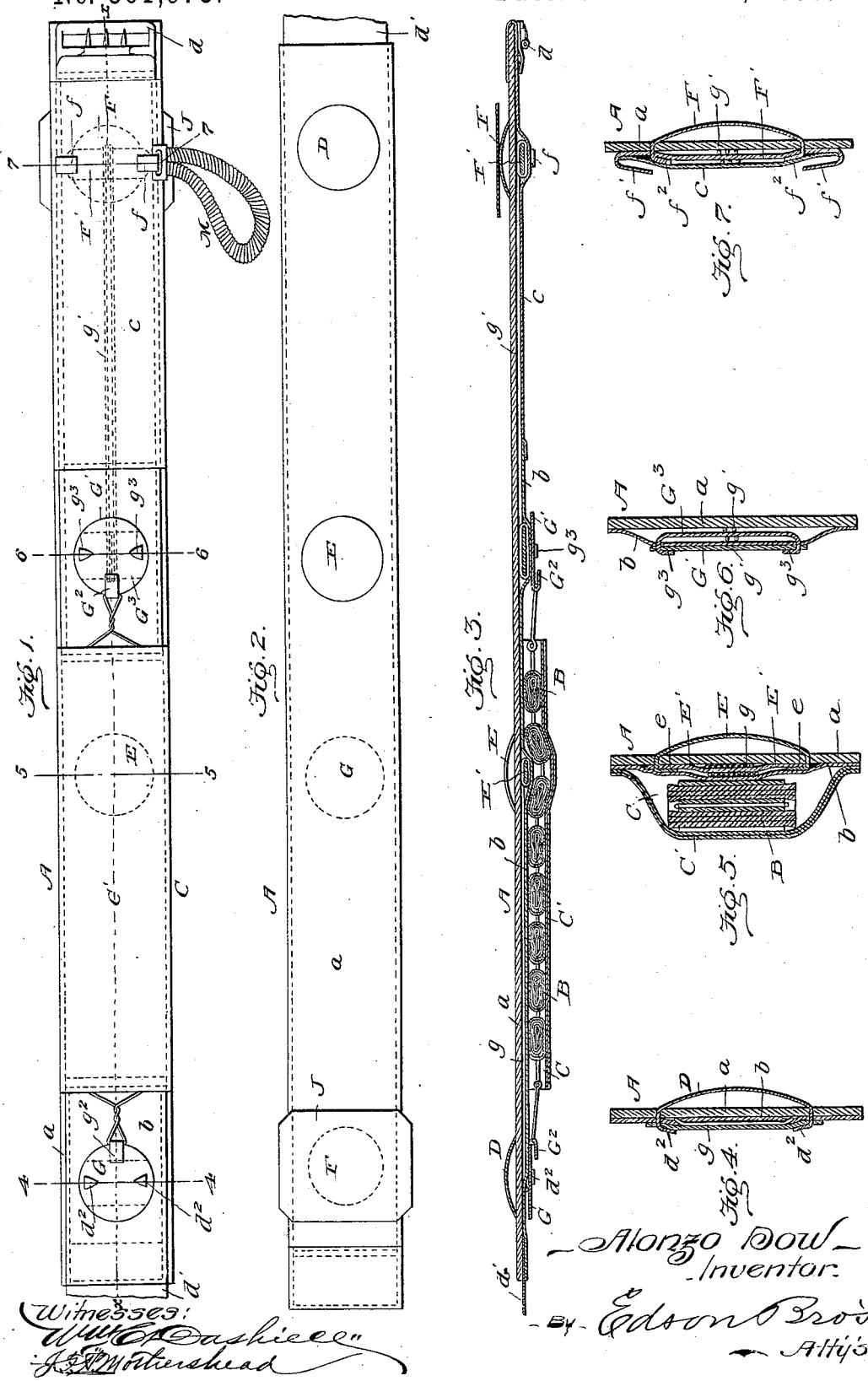
(No Model.) 2 Sheets—Sheet 1.

A. DOW.

ELECTROGALVANIC BELT.

No. 561,975. Patented June 16, 1896.



Witnesses:
Wm. C. Dashiell
J. S. Mortershead

Alonzo Dow
Inventor.
By Edson Bro's
Att'ys.

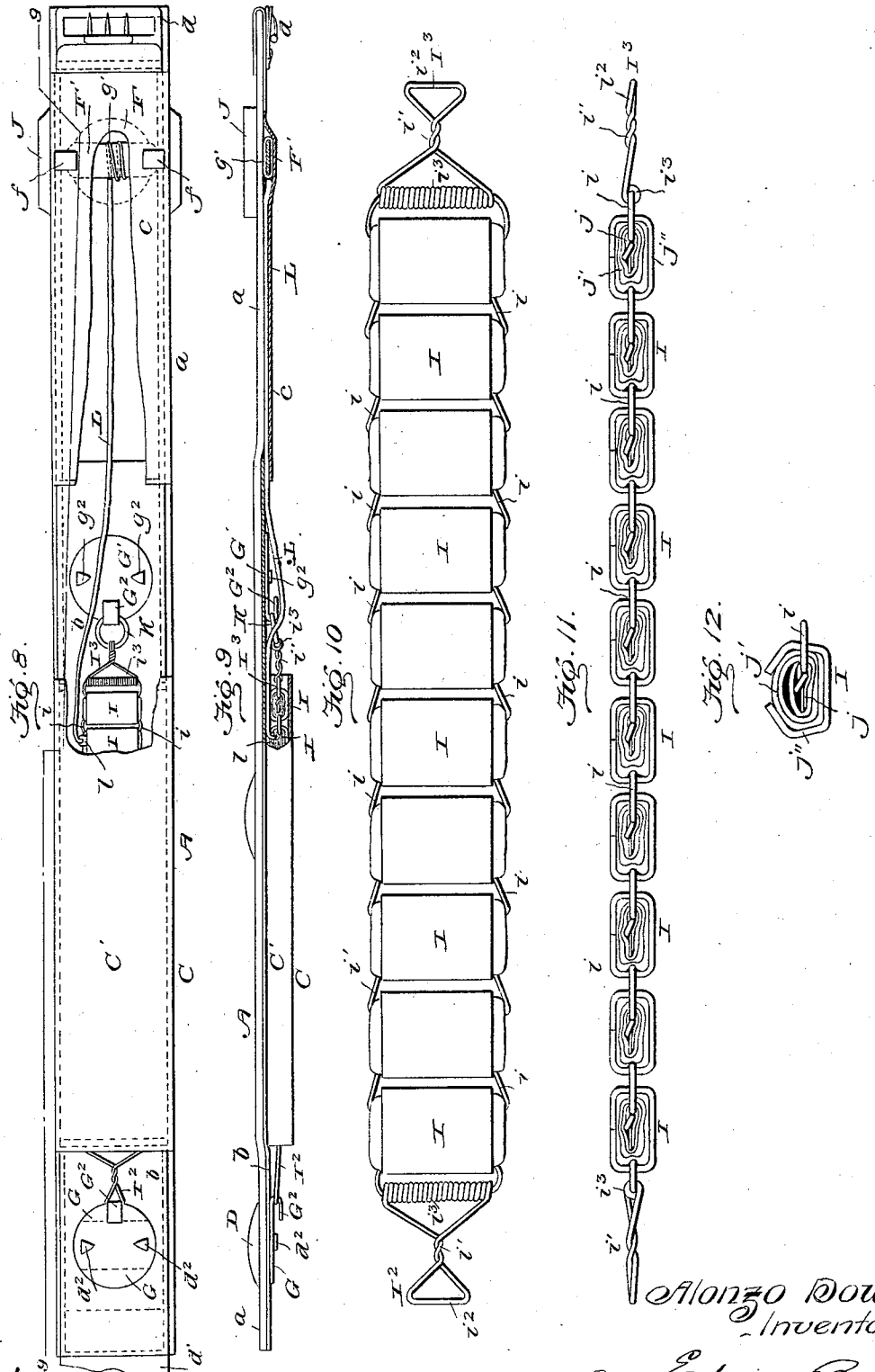
ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

(No Model.) 2 Sheets—Sheet 2.

A. DOW.

ELECTROGALVANIC BELT.

No. 561,975. Patented June 16, 1896.



Witnesses:
Wm. C. Cashiell
J. H. Mothershead

Alonzo Dow
Inventor
By Edson Bros
Att'ys.

ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

UNITED STATES PATENT OFFICE.

ALONZO DOW, OF WOOSTER, OHIO.

ELECTROGALVANIC BELT.

SPECIFICATION forming part of Letters Patent No. 561,975, dated June 16, 1896.

Application filed February 17, 1896. Serial No. 579,670. (No model.)

To all whom it may concern:

Be it known that I, ALONZO DOW, a citizen of the United States, residing at Wooster, in the county of Wayne and State of Ohio, have invented certain new and useful Improvements in Electrogalvanic Belts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in electrogalvanic belts in which two negative body-electrodes are arranged in parallel electric relation and used in connection with a single positive body-electrode, with means for regulating the volume of the current of energy to be transmitted to the body of the wearer.

The object of the invention is to provide a simple construction in which a short battery with a minimum of weight is carried and protected within a sheath which does not require foldable flaps to inclose the battery, and to provide simple means for regulating the volume of the current as the wearer may desire.

To the accomplishment of these ends my invention consists in the construction and combination of parts which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the same, in connection with different embodiments of devices for regulating the current, in the accompanying drawings, forming a part of this specification and in which—

Figure 1 is an elevation looking at the battery side of an electrogalvanic belt constructed in accordance with my invention. Fig. 2 is an elevation looking at the reverse side of the belt. Fig. 3 is a horizontal longitudinal sectional view on the plane indicated by the dotted line *x x* of Fig. 1; Figs. 4, 5, 6, and 7, transverse sectional views on the planes indicated by the dotted lines 4 4, 5 5, 6 6, and 7 7, respectively, of Fig. 1. Fig. 8 is an elevation looking at the battery side of an improved galvanic belt, illustrating a different embodiment of the current-regulator from the regulator shown by Figs. 2 and 6; and Fig. 9 is a view, partially in section, the plane of the section being indicated by the dotted line 9 9 on Fig. 8. Figs. 10 and 11 are side and edge views, respectively, of the battery detached from the sheath. Fig. 12 is a detail view of one of the cells of the battery.

Like letters of reference denote corresponding parts in all the figures of the drawings.

I will first proceed to describe the embodiment of my invention shown by Figs. 1 to 6, inclusive, in which I employ the belt A and a short battery B.

The belt A is made up of pieces of different materials to afford a strong structure and which will not be liable to saturation from the exciting fluid of the battery. The belt has a strip or layer of stout fabric *a*, to one face of which is applied a layer of waterproof material *b*, such as oil-cloth or other liquid-resisting material. This oil-cloth layer *b* preferably does not extend the full length of the stout fabric *a*; but it terminates beyond the positive battery-plate, presently referred to, and from this short end of the oil-cloth layer *b* a lining *c* of suitable soft material extends to the end of the belt A. A suitable fastener—as the buckle *d*, for example—is attached to the end of the stout fabric layer *a*, and to the opposite end of the fabric layer *a* is attached the pliable strap *d'*, preferably of webbing or fabric, which strap *d'* is adapted to be secured in the buckle; but I would have it understood that the means for adjustably fastening the belt can be changed as desired.

The pocket C for carrying the battery is formed by and between the liquid-proof part *b* of the belt and the sheath C'. This sheath consists of two or more layers, one of waterproof fabric and the other of any suitable lining material, and this sheath C' is attached along its side edges, as by sewing, to the belt. A pocket or receptacle, open at both ends, is thus provided for the reception of the battery B, said battery being of a length equal to the pocket and adapted to be slipped in or withdrawn endwise through the said pocket or receptacle. This construction enables me to dispense with foldable flaps, usually employed heretofore to inclose the battery.

D E designate the two negative body-electrodes, and F is the positive body-electrode, all arranged on the inner side or face of the fabric *a* of the belt. One negative body-electrode D is situated at one end of the belt A. The positive body-electrode F is attached to the opposite buckle end of the belt, and the

other negative body-electrode, E, is attached to the belt between the body-electrodes D F and at such distance from its companion negative body-electrode D as to adapt the two negative body-electrodes D E to be applied to the body on opposite sides of the kidneys when the belt is worn.

In connection with the battery and the body electrodes D F, I employ the battery-electrodes G G′, one of which, G, is electrically connected to the negative body-electrode D, and the other, G′, is electrically connected by the fine wires *g* to the positive body-electrode F, while the two negative electrodes D E are electrically connected in parallel electric relation by the fine wires *g′*, as presently described.

The negative battery-electrode G is applied to the layer *b* of the belt, and it has apertures through which are passed the prongs d^2, that are integral with the negative body-electrode D, and which are clenched down upon the battery negative electrode G to have good electrical contact therewith. These prongs d^2 of the electrode D pass through the layers *a b* of the belt, and the wires *g* are passed through the layer *b*, so as to press against the battery-electrode G, and the prongs serve to clamp the electrodes D G to the belt and to press the bare metal wires *g* and electrode G closely together, so that the wires *g* and the two electrodes all have electrical contact, the described construction being shown by Fig. 4. The other negative body-electrode E has prongs *e*, which pass through the belt-layer *a* and through apertures in the ends of a conducting-plate E′, which is situated between the belt-layers *a b*. The ends of the bare metal wires *g* are connected electrically to this conducting-plate, and the prongs *e* serve to establish electrical connection between the plate E′ and the body negative electrode E as well as holding the electrode E and plate E′ securely in place on the belt A, said construction being shown by Fig. 5. The other or positive battery-electrode, G′, is applied against the belt-layer *b* at the opposite end of the sheath C from the battery-electrode G, and these electrodes have the integral or bent-up hooks G^2, to which are connected loops on the ends of the battery B.

The positive battery-electrode G′ has apertures punched therein, and between the belt-layers *a b* is a conducting-plate G^3, provided with prongs g^3, which are passed through the belt-layer *b* and the holes or apertures in the electrode G′, as shown by Fig. 6, said plate G^3 serving to clamp itself and the electrode G′ to the belt-layer *b*, and the plate G^3 and electrode G′ being electrically connected by the prongs g^3, which are bent or pressed down against the electrode G′. To this plate G^3 are electrically connected the bare metal conductors or wires *g′*, which lie between the belt-layers *a c* and extend from the plate G^3 to and are electrically connected with a conducting-plate F′, which is clamped in place by and electrically connected with the positive body-electrode F. This plate F′ lies between the belt-layers *a c*, and at its ends are the bent or hook-shaped tongues *f′*, which pass through the lining *c* and are exposed on the outer side of the belt to provide for the attachment of conductors, which may lead to any part of the wearer's body. The positive body-electrode F has integral prongs f^2, which pass through the belt-layer *a* and through the holes in the metallic plate F′, and said prongs are bent or clenched down upon the plate to clamp the parts F F′ in place on the plate and connect them electrically, as shown by Fig. 7.

The detailed construction of the battery B is shown more clearly by Figs. 10, 11, and 12 of the drawings, by reference to which it will be seen that a series of cells I are flexibly coupled together by the wire connectors *i* and that the end cells of the battery have loops 12 13 for attaching the battery to the hooks G^2 of the battery-electrodes G G′. Each cell of the battery consists of a folded copper plate *j*, a layer *j′* of absorbent material, as felt, coiled around the copper plate, and a bent zinc plate *j″* around the coiled absorbent layer, as shown by Fig. 12. The wire conductor *i* passes through the folded copper plate *j* of one cell and between the zinc plate and absorbent pad of an adjacent cell, so as to be connected at its opposite sides to opposite elements of two adjacent cells. To the positive element of one end cell of the battery is attached a connector *i*, to which the loop I^2 is attached, and the negative element of the cell at the opposite end of the battery is connected a conductor-loop *i*, to which is attached the other loop I^3, whereby the loops I^2 I^3 are adapted to electrically and detachably couple the battery B to the battery-electrodes. Each loop I^2 I^3 is formed of a length of wire bent and twisted together at *i′* to form the eye i^2, by which the loop may be attached to the battery-electrode, and the opposite ends of the wire are coiled at i^3 to provide the eyes that receive the battery-terminal connector-loops, thus providing loops which flexibly connect the battery to its electrodes.

To the belt A, adjacent to the positive body-electrode F, is attached a shield or flap J, preferably of fabric. This shield or flap is attached at one edge only to the belt, so that the flap may be turned to lie over the positive body-electrode F, or it may be turned over the edge of the belt, so as to fully expose said electrode.

To secure the full benefit of the current from the battery, the flap or shield J is turned back to expose the positive body-electrode and thus adapt it to press directly against the flesh; but if a milder current is desired said flap is turned down over the electrode F, so as to lie between the wearer's flesh and the electrode. This flap provides one means for regulating the strength of the current to be applied to the body.

In Figs. 8 and 9 I have illustrated another construction by which the battery-current may be regulated. In this embodiment of my invention the negative pole or end of the battery has a loop, as I^3, to connect that end of the battery to the negative battery-electrode G; but the opposite positive pole of the battery has an insulating-ring K, of hard rubber or other suitable insulating material, which is attached to the loop I^3 and affords a means for attaching the battery to the positive battery-electrode G'. As a means for connecting the positive pole of the battery and the positive body-electrode I have provided the insulated conductor L, one end of which is electrically connected to the plate F' of the positive electrode. The free end of this regulator-conductor has a conductor-plate of electropositive material, as at *l*, which can be thrust into the absorbent pad of any one of the series of battery-cells.

The hook-shaped tongues of the plate F' of the positive body-electrode afford convenient means for the attachment of conductors, which may be carried to any part of the wearer's body, and in Fig. 1 I have shown as one type of this conductor a flexible wire loop M to be fitted to the male genital organs. It is to be understood, however, that other conductors may be used to convey the current to the knees, feet, or any part of the body.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an electrogalvanic belt, the combination with a suitable belt, of battery-electrodes attached thereto, a battery detachably coupled to said electrodes, two negative body-electrodes connected in parallel electric relation to each other and with one of the battery-electrodes, and a positive body-electrode in electrical connection with the other battery-electrode, substantially as described.

2. In an electrogalvanic belt, the combination with a belt and a battery, of a battery-electrode G, a negative body-electrode D clamped to the battery-electrode, another negative electrode E clamped to a conductor-plate E', a conductor in electrical connection with the plate E' and the battery-electrode G, and a positive body-electrode in electrical connection with the opposite pole of the battery, substantially as and for the purposes described.

3. The combination with a belt, and a battery, of a positive battery-electrode having a clamping-plate which lies between layers of the belt, a positive body-electrode clamped to a plate within the belt-layers, and conductors connecting the two plates of the body and battery electrodes, substantially as described.

4. The combination of a belt provided with an open-ended longitudinal receptacle or pocket, of battery-electrodes attached to said belt, a battery inclosed within, and removable lengthwise from, said receptacle or pocket and provided with means for attachment to the battery-electrodes, and body-electrodes connected with the respective battery-electrodes, substantially as and for the purposes described.

5. A composite belt having a sheath attached at its side edges only to said belt and forming an open-ended receptacle or pocket, combined with the battery-electrodes attached to the belt outside of the pocket or receptacle, a battery adapted to be inclosed in the pocket or receptacle and provided with connectors in electrical connection with the respective battery-electrodes, substantially as described.

6. The combination with a belt, and a battery, of the battery-electrodes to which are connected the opposite ends of said battery, a conductor-plate F' having means for the attachment of conductors thereto, a positive body-electrode clamped to said plate F', conductors *g'* between one battery-electrode and the plate F', and a negative electrode in circuit with the opposite battery-electrode, substantially as described.

7. In an electrogalvanic belt, the combination with a belt and a battery, of two negative body-electrodes attached at intervals to the belt and connected in parallel electric relation to each other and the negative pole of the battery, a positive body-electrode in electrical connection with the positive pole of the battery, and means for use in connection with said positive body-electrode to regulate the volume of the current which may be applied to the body, substantially as and for the purposes described.

8. In an electrogalvanic belt, the combination with a belt, the battery-electrodes, a battery having an insulating attaching-ring for connection with the positive battery-electrode and a negative body-electrode, of a positive body-electrode, and a fabric flap or shield attached to the belt and adapted to fold over the positive body-electrode, substantially as described.

9. The combination with a belt, of body-electrodes fitted to one side of the belt, battery-electrodes attached to the opposite side of the belt and electrically connected with their respective body-electrodes, and a battery coupled to the battery-electrodes, substantially as and for the purposes described.

10. The combination with a belt, of battery-electrodes fastened to the belt, positive and negative body-electrodes fastened to the opposite side of the belt from the battery-electrodes, connections between the respective body and battery electrodes, a battery connected at one end to one battery-electrode and having at its opposite end an insulating-ring for connection with the other battery-electrode, and a conductor in electrical connection with the positive body-electrode and provided with a plate adapted to be inserted

into one of the cells of said battery, as and for the purposes described.

11. In an electrogalvanic belt, the combination with a belt, of a plate applied thereto and provided with transverse apertures, and another plate applied against the reverse side of the belt, or a part thereof, and having prongs which pass through the belt and the holes in the first-named plate to clamp the two plates upon the belt and connect the plates electrically, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALONZO DOW.

Witnesses:
MAHLON ROUCH,
H. H. HUBBELL.