(No Model.)

2 Sheets—Sheet 1.

I. GRAY.

THERAPEUTIC ELECTRIC BELT.

No. 347,592. Patented Aug. 17, 1886.

FIG. 1.

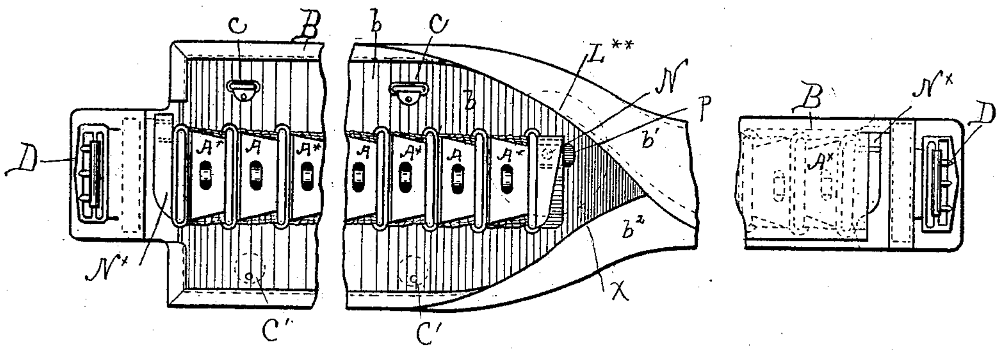


FIG. 2.

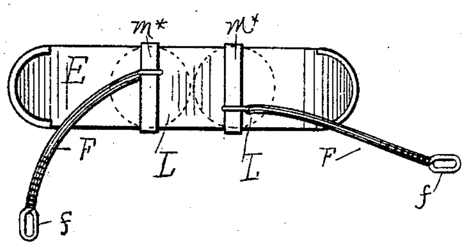


FIG. 3.

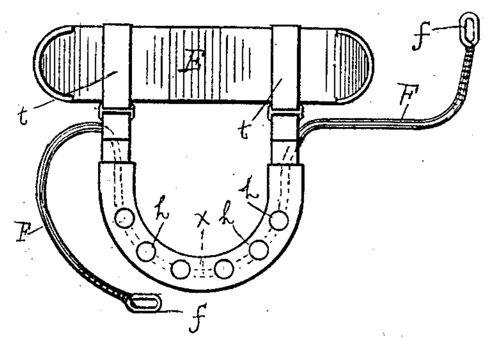
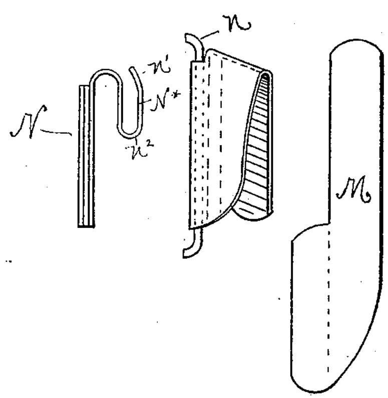


FIG. 4.



Witnesses

Inventor

By his Attorney

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

I. GRAY.

THERAPEUTIC ELECTRIC BELT.

No. 347,592. Patented Aug. 17, 1886.

FIG. 5.

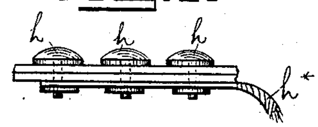


FIG. 5a

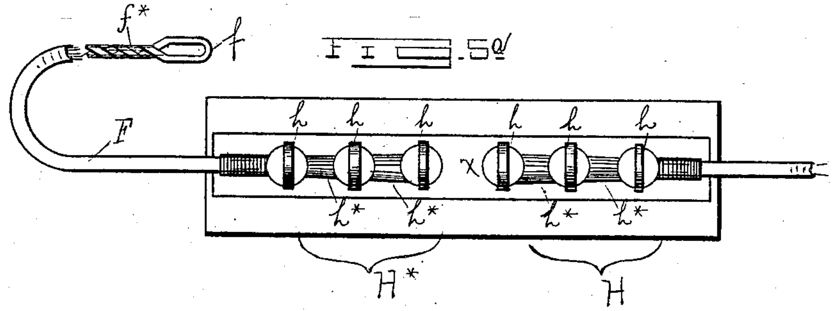


FIG. 6.

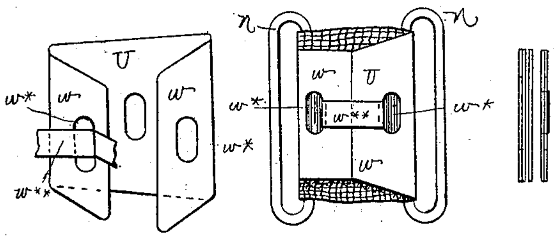


FIG. 7.

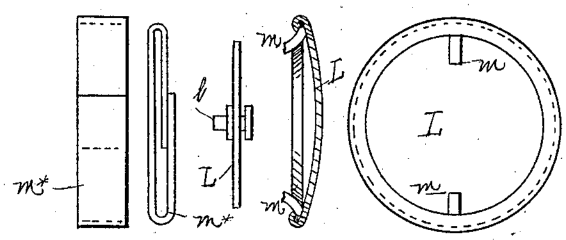
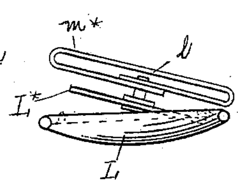


FIG. 7a



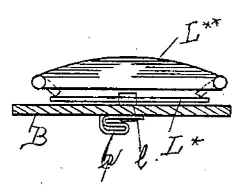


FIG. 8.

Witnesses
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UNITED STATES PATENT OFFICE.

IRA GRAY, OF SAN FRANCISCO, CALIFORNIA.

THERAPEUTIC ELECTRIC BELT.

SPECIFICATION forming part of Letters Patent No. 347,592, dated August 17, 1886.

Application filed April 15, 1884. Serial No. 128,045. (No model.)

To all whom it may concern:

Be it known that I, IRA GRAY, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Electro-Therapeutic Belts; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain improvements in electric therapeutic belts, the objects whereof are simplicity of construction, cheapness of manufacture, durability in wear, and greater effectiveness in operation.

The several parts and features of this invention are improvements upon the belt patented to me on the 30th day of August, 1881, under Letters Patent bearing that date and numbered 246,387, and they are produced and combined substantially as follows:

In the drawings herein referred to, Figure 1 is a view of the belt, showing portions broken out to economize space, and also illustrating the belt with the wrapper open, partially closed, and closed. Fig. 2 is a view of the elastic connecting-piece with the cathodes shown in dotted lines upon it, which are adapted for use upon female patients. Fig. 3 is a view of the same piece as Fig. 2, with appliances for male patients. Fig. 4 represents, respectively, an edge view and perspective of a hook employed in uniting the parts, and also a blank from which it is made. Figs. 5 and 5ª are respectively edge and side views of the attachment to the elastic piece shown in Fig. 3. Fig. 6 shows open, closed, and sectional views of the wrapper for the cells. Figs. 7, 7ª, and 8 are detail views of the electrodes and the manner of securing them.

In this improved belt, as shown in Fig. 1, the batteries or the series of connected cells A A*, constituting the generators, are inclosed in a case or wrapping, B, that forms also the supporting-band, by which the device is secured around the body of the wearer. This case has a water-proof inner facing, *b*, and has two flaps, *b'* *b²*, that are of suitable width to overlap each other, and cover the line of cells A A*. The body of the case is of felt, and the water-proof surface is made of any suitable material, such as oil-cloth. The flaps have catches *c* *c'* to hold them together. Buckles D D, on the ends of the case, take the ends of an elastic strap, E, (see Figs. 2 and 3,) that completes the circle of the belt around the body, and affords adjustment to the size of the person with any desired degree of tightness. This same strap holds the cathodes or the terminals at the front of the belt through which the current is applied locally to the sexual parts, and, being separable and readily detached from the principal belt, the electrodes at this point can be changed and regulated as desired. The belt will be so located upon the body of the wearer as to bring these cathodes in part E over the desired point. Two different forms of electrode for this part of the belt are provided—one for the female and the other for the male patient. In the first-named one the strap E, Fig. 2, has two circular plates, L, each formed of a detachable head and a metal disk, L*, that is attached to the strap by a clasp or slide of metal, *m** *m**. (See Figs. 7 and 7ª.) The belt having two independent batteries, A A', these electrodes at the front are their negative terminals, while the electrodes L** L** at the back of the belt are their positive terminals. (See Fig. 8.) The anodes L** are connected with the first cells of their batteries by the fastenings that also attach the batteries to the belt, but the cathodes L L or H H (see Figs 7 and 7ª and Figs. 5 and 5ª) upon the strap at the front have connection electrically with the front ends of the batteries by flexible conductors. The like poles of the two batteries are therefore adjacent to each other, but of course are separated electrically by the space *x* left between them.

The connection of the first cell of the battery to the belt and the electrode L** is made by the hook N and a clip or loop, *p*, (see Figs. 7 and 8,) of conducting metal of peculiar construction, that, in addition to its character as an electrical connection between battery and electrode, furnishes an attachment of the battery to the belt or supporting-case. The hook is produced from a metal blank, M, (see Fig. 4,) which is bent around the link *n* and secured by flattening or clinching, and at the end is bent upon itself to form the hook. From the same blank is produced the hook and connection N*, Fig. 1, for the end of the battery at the front. At this point there

is both the attachment of the battery to the supporting-belt to be made, and the connection of the flexible conductor F, (see Figs. 2, 3, and 5ª,) to be provided, and the single fastening N* gives this additional connection by being bent over upon itself a second time to form the double hooks n' n^2, Fig. 4, one to enter the loop p, Fig. 8, and the other to take the loop f, Figs. 2, 3, and 5ª, that forms the end of the flexible conductor. The loops p are strips of conducting metal having rivets passed through from the back and then upset and headed on the end. At the back loop this rivet is the center pin or stud, l, Figs. 7, 7ª, and 8, that has the disk L* fixed to it, or that, being passed through both this disk on the outside and the loop p on the inside of the felt case, serves to secure the parts together.

The removable plate-head L of each electrode is formed with a turned-over edge and has inwardly-extending points or catches m on the inner face. The disks L* are of flexible metal, so that by being pressed into the plate at one side and under one of the points each disk and plate is locked together by simply slipping it by a rotary movement under the other point and beneath the turned edge. Figs. 7, 7ª, and 8 of the drawings illustrate this mode of forming and placing the parts together.

The flexible conductors are attached at f to the electrodes and to the hooks N* at the other ends.

The cathodes for the female patients are simple disks L L, fixed to the strap E, as above described; but those for the male are composed each of a series of smaller disks or buttons, h h, placed at intervals apart, and upon the outside of a small felt case or suspensory loop, S, within which a connecting metal ribbon, h*, joins all those of one set together, and also extends outward to the end, where it continues beyond the felt in the form of a covered conductor of sufficient length to join the battery. Figs. 3, 5, 5ª show the mode of arranging these electrodes. One series, H, of these buttons forms one electrode, and the other set, H*, constitutes the other electrode. This cathode is suspended from the elastic strap by the elastic tapes t t, and the conductors F F from the ends are fastened on the hooks N*. To adjust one set of electrodes for the other, it only requires the removal of one strap, E, with its electrodes and the substitution of another strap with the other style of electrodes mounted on it.

The belt itself is practically inelastic, but the strap E is made of elastic material, so as to afford adjustment to different sizes of waists.

The outer plates of each cell or section of the battery are secured and bound around the other parts within by a fastening means of a novel character. For this purpose the plate U is cut out of sheet metal in the form shown in Fig. 6 of the drawings, so that its edges w when bent over shall meet together and cover one side. Through slots w* cut out of the metal just within the edges of each flap w is passed a metallic lacing-strip, w**, by which the flaps are drawn and held together. The simplicity of this fastening enables the parts of the cells to be easily and firmly bound together, and yet with such facility for loosening and separating the parts that the necessary repairing and renewing of the metals and the felt absorbent can be done without breaking or injuring the outside metal clasping-plate U.

The metal loops f, that form the tips of the conductors F, are produced by bending a short piece of wire over upon itself and then twisting the ends together. This twisted portion forms the shank f* and affords a firm connection of the conducting wire or strands of the conductor, so that when the outer insulating-wrapping is brought over the shank and secured by whipping it close up to the loop a strong fastening is obtained.

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

1. The combination of the batteries having the exposed terminal electrodes, the case B, with water-proof lining b and flaps b' b^2, the catches c c', and the loops and hooks p N, each forming a connection to the electrodes, as described, and being formed of a single piece of metal bent into shape, substantially as described.

2. The combination, with the electric belt having batteries, as described, of the fastenings that constitute also electric connection of electrode to battery, composed of the loops p and the hooks formed from a single piece of metal bent upon itself in two directions, as shown, and substantially as described.

3. In combination with the parts of the member or section of the battery, the outer plate, U, having flaps w, with lacing-holes w*, and the metal lacing w**, substantially as described.

4. In combination with a therapeutic belt, the electrode composed of the detachable disk L, the disk L*, having permanent attachment to its supporting-belt, and the catch-pins m, substantially as described.

5. An electrode for body-wear, consisting of a flexible metallic disk, L*, provided with a loop or analogous attaching means, m*, and the detachable plate L, having the turned-over rim, as described, and the projections m, for engaging the disk L*, substantially as and for the purpose set forth.

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Witnesses:
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JNO. L. TAGGARD.