

T. W. GRAYDON.
Galvanic-Belt.

No. 226,658.

Patented April 20, 1880.

Fig. 1.

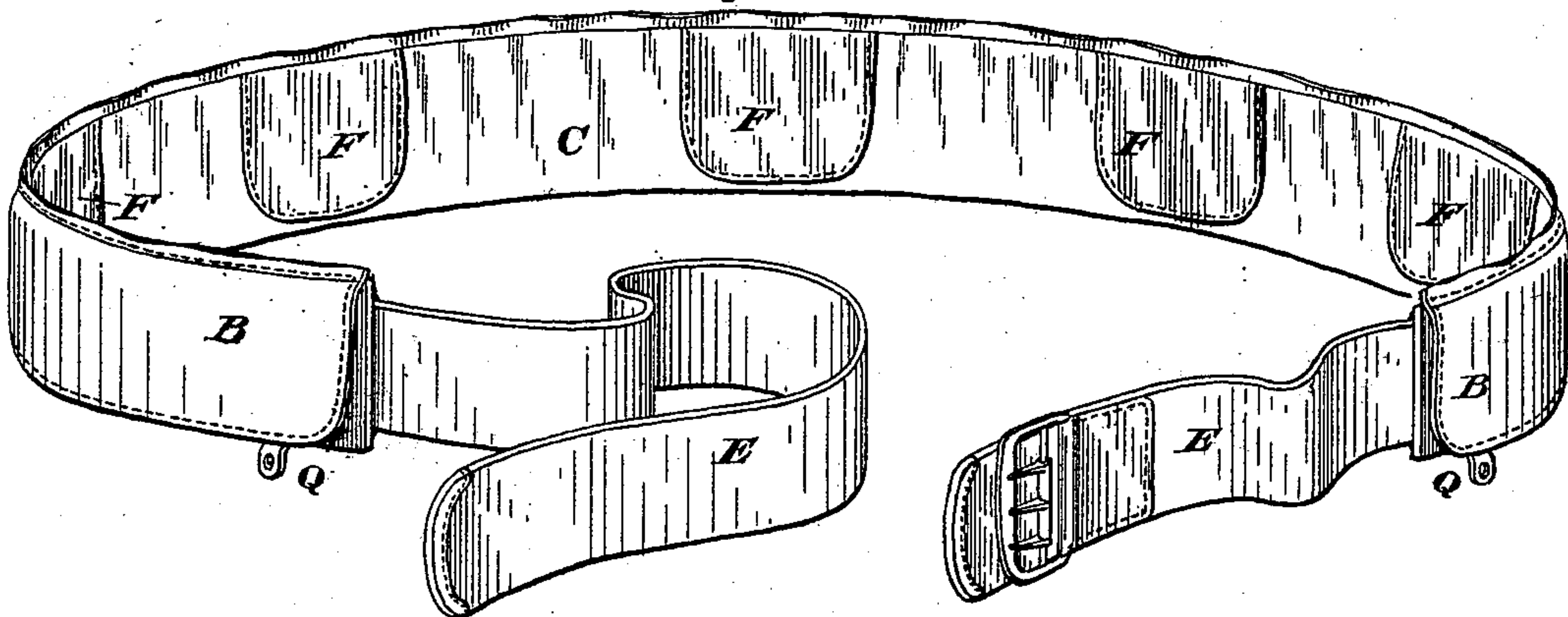


Fig. 2.

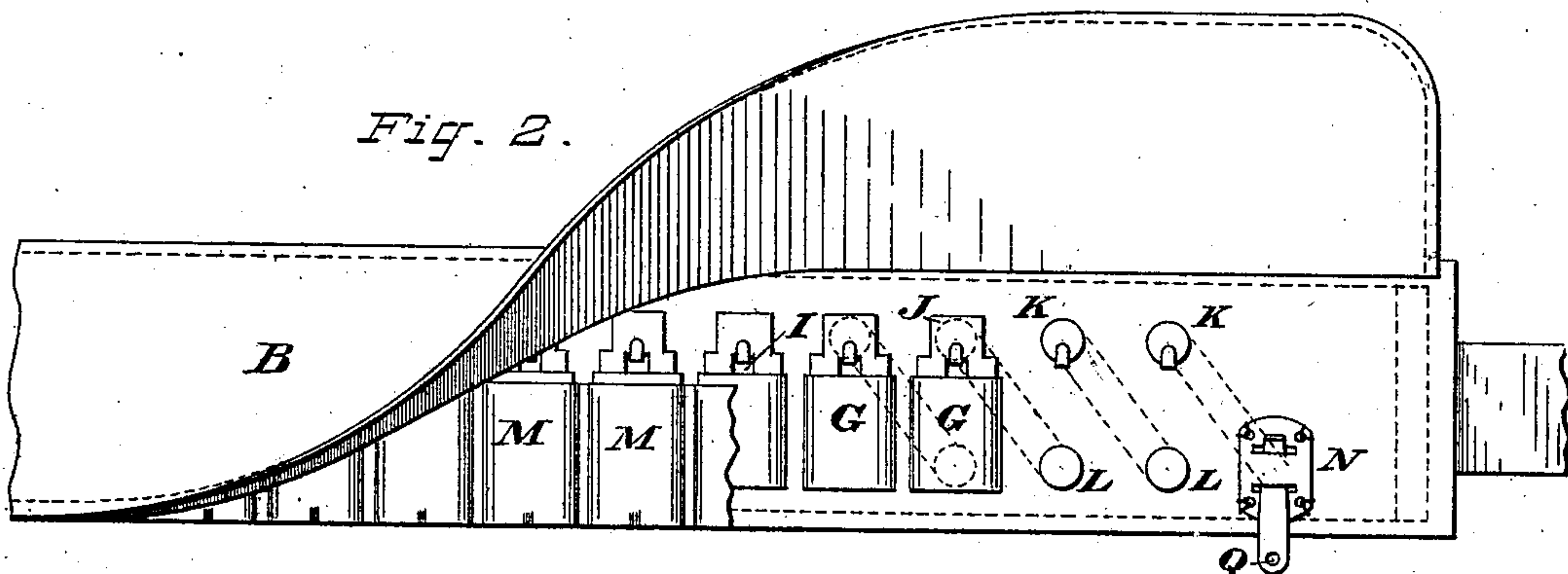


Fig. 3.

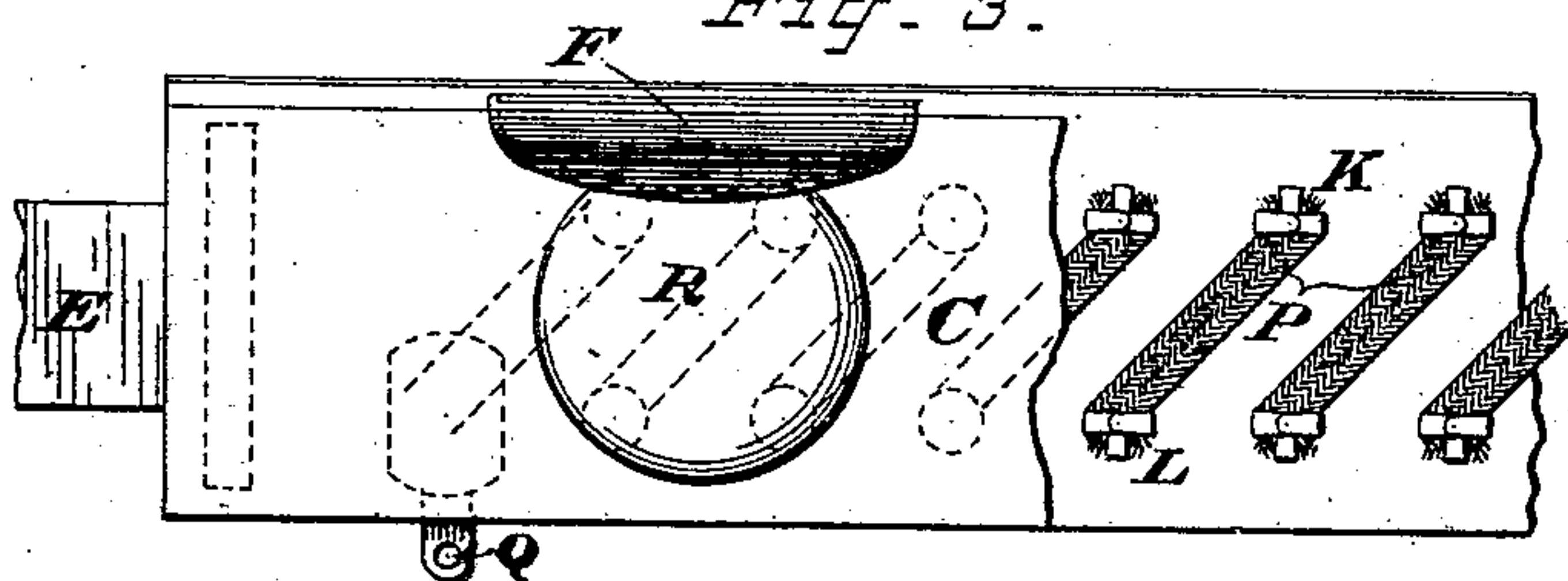


Fig. 4.

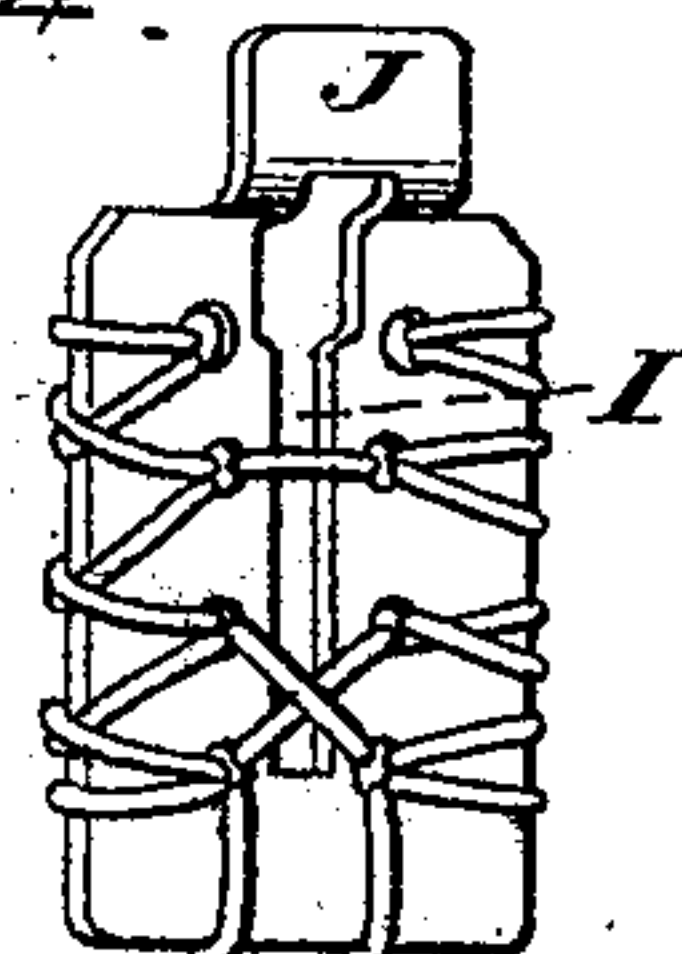


Fig. 5.

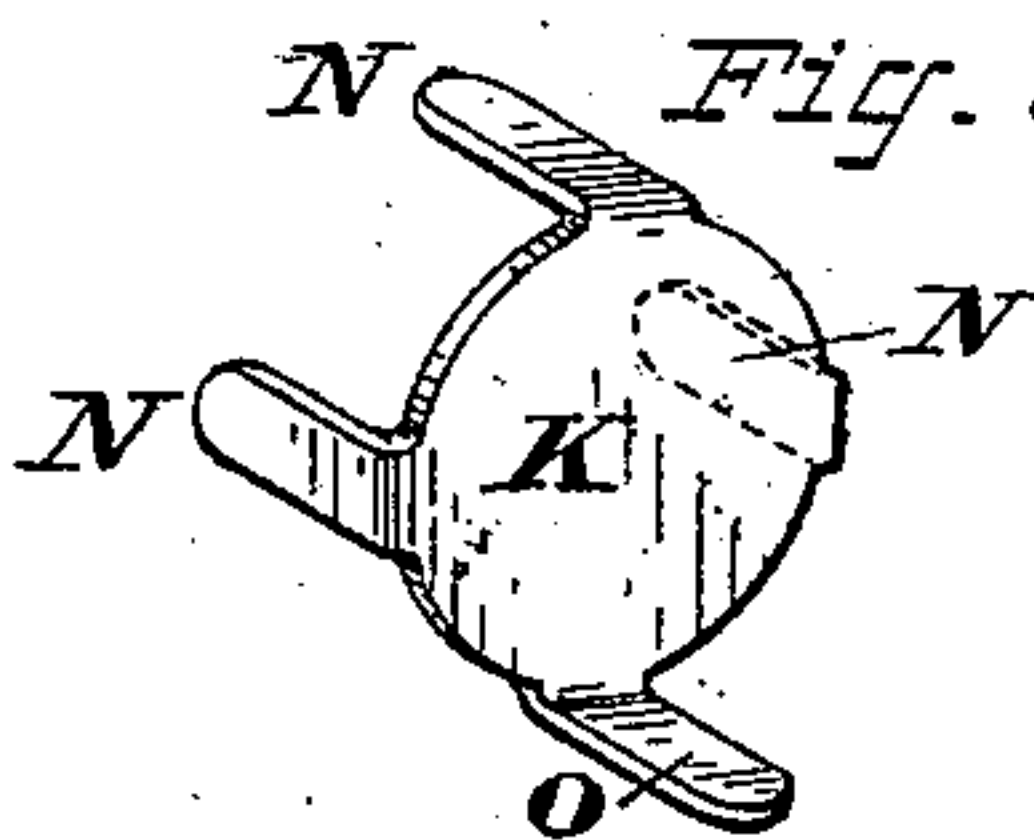


Fig. 6.

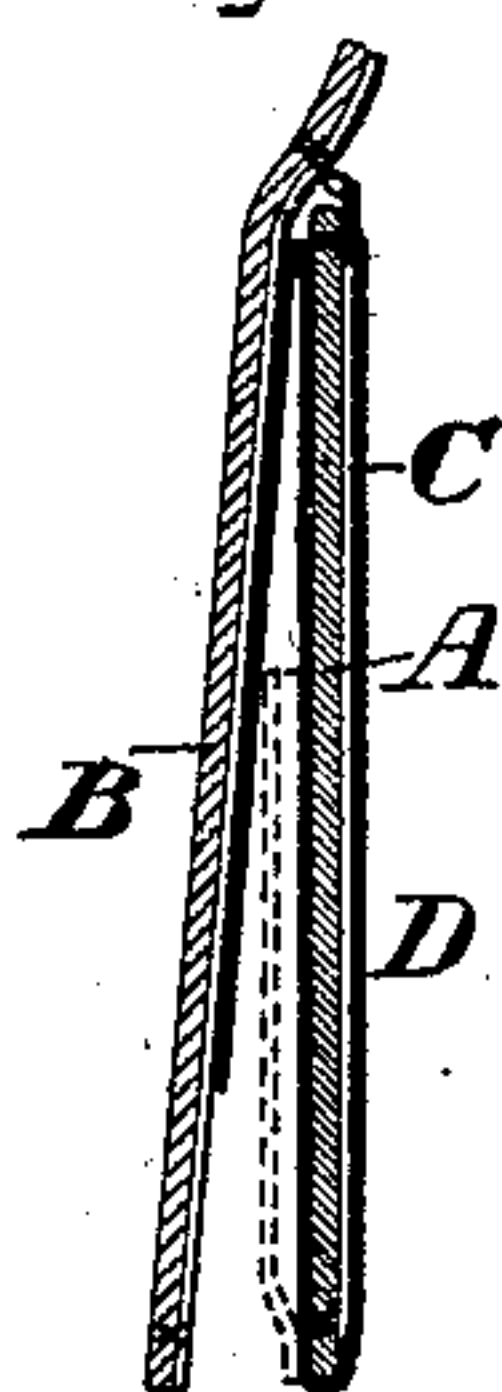
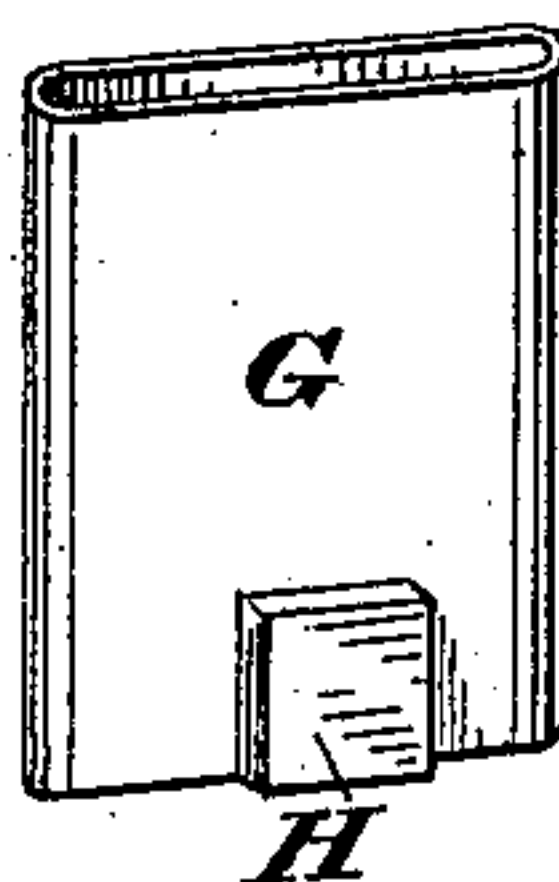


Fig. 7.



ATTEST :

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INVENTOR :

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UNITED STATES PATENT OFFICE.

THOMAS W. GRAYDON, OF CINCINNATI, OHIO, ASSIGNOR TO JOHN EDWARD HETHERINGTON, OF NEW YORK, N. Y.

GALVANIC BELT.

SPECIFICATION forming part of Letters Patent No. 226,658, dated April 20, 1880.

Application filed July 1, 1879.

To all whom it may concern:

Be it known that I, THOMAS W. GRAYDON, of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Volta-Electric Belts, of which the following is a specification.

My invention relates to that class of voltaic batteries which are intended to be worn around the body, and through the medium of electrodes in contact with any certain parts of the body transmit their effects to those parts; and the object is to provide a belted battery capable of transmitting its force for a comparatively long time, simple in its construction and manipulation, not liable to become inactive from deposits, and capable of transmitting its full strength from terminals or diffusing its influence through intermediates.

My invention consists of various details of construction and in certain arrangements and combinations of parts which will be more definitely hereinafter set forth in the specification and claims.

It is not my intention in this specification to speak of the therapeutic value of voltaic action, as this is well understood. I will simply describe my improved devices and explain the mode of their application.

In the drawings, Figure 1 is a perspective view of my improved belt with the outer and inner flaps turned down. Fig. 2 is an elevation of the negative end of the belt with the outer flap partially raised and the general arrangement exhibited by partial dissection. Fig. 3 is a view of the inner face of the negative end with one inner flap lifted and a portion of the inner covering broken away to exhibit the conductors. Fig. 4 is a perspective view of a negative element. Fig. 5 is a perspective view of a positive pole or element. Fig. 6 is a perspective view of a contact-piece. Fig. 7 is a transverse section through the belt proper.

The belt proper is constructed preferably of leather and sheet-rubber, and consists (see Fig. 7) of a base, A, to which is attached the outer flap, B, free to be raised. An inner surface sheet, C, is attached to the inner side of the belt. Those parts which are section-lined in Fig. 7 represent leather, and the heavy black line D indicates an inner and outer covering

of sheet-rubber or rubber cloth. The outer leather, B, is to give substance to the belt and enhance its appearance. It will be seen that the rubber D is continuous throughout the section.

The base A gives strength and substance to the structure. Under the front flap is stitched a rubber strip, so as to form a series of pockets, as shown in Fig. 2. These are indicated by the dotted lines in Fig. 7.

The belt is provided with suitable straps E, whereby it may be buckled around the body, and has upon its inner surface several small flaps, F F, all as shown best in Fig. 1. In Fig. 3 one of these flaps is shown as partly raised.

G, Fig. 5, shows one of the battery-cups. This is made of copper, and forms the positive pole of an element. It is formed from thin metal, and, with the exception of the open top, is water-tight. Upon one side, preferably near the bottom, is formed the projection H, which is the contacting positive terminal of the element. The outer surface of this copper cup is covered with an insulating varnish— asphaltum, for instance—the surface of the projection H only being left bright.

The negative pole of the element shown in Fig. 4 is made of zinc properly amalgamated, and is of such size as to enter the cup G easily. It is slotted, as at I, and is provided with an offset top shank, J. The offset is such that when the zinc is in place in the cup the face of the shank will lie approximately in the same plane as the face of the projection H on the cup.

The slot I extends into the shank J, and is somewhat wider at this point than below. The zinc is perforated, and soft cord is stitched through and through the same, somewhat as shown, being so arranged as to leave the general surface of the zinc exposed. The zinc so provided should fit the cup nicely, and the cord should be of such a character as to properly absorb the exciting-liquid.

Having described the general construction of a belt and of a battery element, I will now return to the belt and describe features which will be more readily understood in view of the description of the battery element already

given. Upon the outer surface of the belt, but under the flap B, are arranged the series of contacts K L, as shown in Fig. 2, so disposed that when the battery elements are placed in the pockets M the contact-surfaces upon the zinc and copper of the elements will find seats upon them.

Fig. 6 shows the form of the contacts K much enlarged. They are struck from sheet metal, with four prongs, three of which (lettered N) are bent backward and one (lettered O) forward. In attaching them to the belt the three prongs are put through the belt proper and clinched upon the back. In making the lower contacts, L, this single prong O is cut off, or else turned back and put through the belt.

Upon the upper contact, K, the prong O is bent upward to form a hook. A battery element being placed in the pocket, the bright copper at H contacts with the lower piece, L, and the slot in the shank of the zinc slips over the hook upon the upper contact-piece, K.

It will be seen that the actual contact is of a frictional or rubbing character, and tends always to wear itself into proper condition and remedy any evil effects arising from oxidation.

Upon the inner surface of the belt proper, but under the inner thickness of rubber C, are fastened gold-lace conductors P, as shown in Fig. 3. These conductors extend diagonally from a lower contact-piece, L, to the next succeeding upper piece, K, thus putting them into electrical communication throughout the length of the belt, as will be readily understood. These conductors P are fastened by their ends being caught under the prongs of the contact-pieces before they are clinched. At each end of the belt is attached a terminal, one of which is shown at Q in three of the figures. Each of these terminals communicates through the gold-lace conductors with those contact-pieces which form the terminals of the battery, one being, of course, a lower contact and one an upper one.

It will be seen that if the terminals Q be joined a proper galvanic circuit will be formed from the negative terminal through the lace to the zinc, from the zinc to the copper in the battery, from the copper through the lace to the succeeding zinc, and so on through all, from the final copper to the positive terminal.

To charge the belt the outer flap is lifted and each cell injected with dilute acetic acid or vinegar of proper strength. The battery thus charged will maintain constant action for about twelve hours, and will develop perceptible action for twenty-four hours after charging.

To apply the belt it is placed around the waist with the cells charged and the outer flap turned down. Two electrodes having attaching bands are placed around the limbs, neck, or other parts of the body, and connected by flexible insulated conductors to the termi-

nals Q of the belt. The electrodes are placed over those parts between which it is desired to have the current pass, and either electrode may be divided so as to cause the current to take two or more courses.

I prefer to make my electrodes the subject of another patent, and will simply state, in connection with this belt, that the attachments between the flexible conductors are to be so formed as to allow the negative attachment to be unhooked from the negative terminal and connected at any point in the battery, so as to reduce the intensity of the action.

Thus far I have explained my belt as yielding its effects through conductors attached to terminals, and have casually mentioned features of varying intensity. I will now describe a feature for dividing or diffusing the current and passing it through the body in a mild and at the same time invigorating manner.

Small flaps F have been referred to as being upon the inner surface of the belt next to the body of the wearer. These flaps cover disk-shaped diffusers R, made of sheet metal, and provided with prongs at the back, by which they are attached to the belt. The prongs pass through the inner layers of the belt and are clinched over any one of the gold-lace conductors P.

I prefer to form a belt with about eighteen elements, and to put in five of the diffusers, uniformly distributed.

When the flaps F are down the diffusers are covered and insulated, and the current acts through the main electrodes. If the flaps are turned up, the diffusers are in contact with the body, and a portion of the current equalizes itself through the body.

I claim as my invention—

1. The combination and arrangement, to form a battery-cup for an electric belt, of the pocket M on the face of the belt, the contact-piece L, exposed on the back wall of the pocket, and the cup G, covered on its exterior with an insulating coating or varnish and provided with an uninsulated projection, H, to contact with the piece L, substantially as set forth.

2. In a voltaic belt, a battery-zinc having a slotted offset shank, J, arranged to engage a projection on the contact-piece, in combination with a battery-cup having a contacting projection, H, substantially as specified.

3. In a volta-electric belt, the base A, provided with a continuous flexible rubber covering, D, the margin of said continuous covering being extended and arranged to form a lining or inner facing for the flap B, substantially as shown.

4. In a voltaic belt, the contact-pieces K, formed with prongs upon their faces, substantially as and for the purpose specified.

5. In a voltaic belt, the combination, with the belt proper, of the contact-pieces K and L and the gold-lace conductors P, substantially as specified.

6. In a voltaic belt, the combination, with the pocketed belt, of the series of voltaic elements composed of the zines and copper cups G, the series of contact-pieces K and L, and
5 the series of gold-lace conductors P, substantially as specified.

7. The combination of the intercellular diffusers R with the conductors P and the insulating-flaps F, the whole being arranged as
10 shown, so that any one or more of said diffus-

ers may be uncovered or exposed while the others are left insulated, substantially as set forth.

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

THOMAS W. GRAYDON.

Witnesses:

W. S. TAYLOR,

D. W. THRASHER.