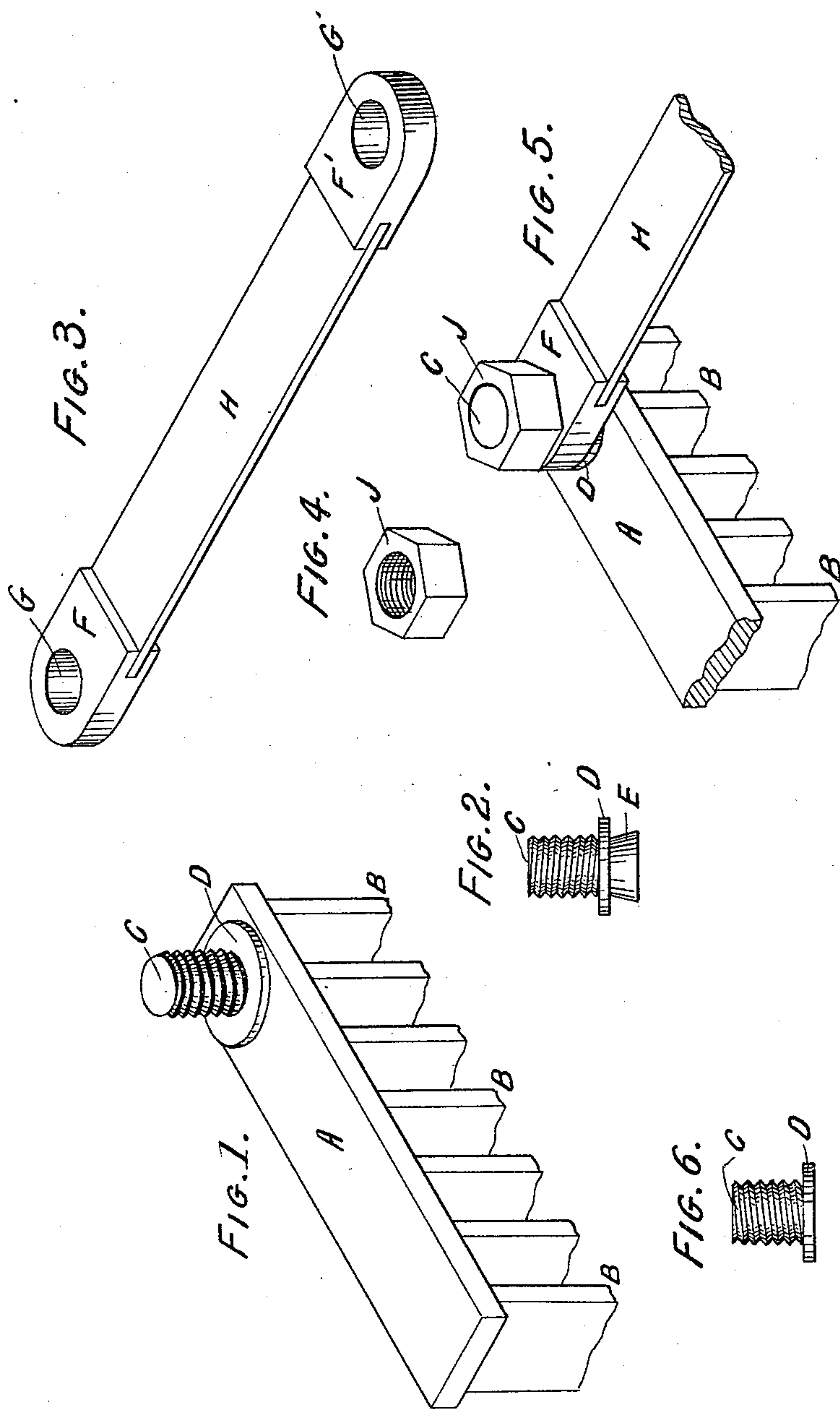


(No Model.)

E. R. KNOWLES.
BATTERY CONNECTOR.

No. 482,012.

Patented Sept. 6, 1892.



WITNESSES.
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BATTERY-CONNECTOR.

SPECIFICATION forming part of Letters Patent No. 482,012, dated September 6, 1892.

Application filed October 15, 1891. Serial No. 408,821. (No model.)

To all whom it may concern:

Be it known that I, EDWARD R. KNOWLES, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Battery-Connectors, of which the following is a specification.

My invention relates to improvements in connectors for batteries.

10 The objects of my improvements are, first, to provide a connector which can be easily and quickly put together and taken apart; second, to provide a connector whose joints shall be rigid and tight when it is put together
15 and shall so remain until it is taken apart; third, to provide a connector which shall not be attacked by acids or other substances used in the batteries, and, fourth, to provide a connector which is cheap and economical in construction.
20

A common fault with connectors for batteries as ordinarily made is that no matter how tightly they may be put together they sooner or later loosen and make bad electrical
25 joints. This is almost always due to the fact that they are composed of soft metals or alloys, which readily flow or change their shape when subjected to pressure. This I propose to overcome by making all their parts of a hard,
30 elastic metal, which when subjected to pressure retains its shape and by its elastic properties maintains the pressure put upon it.

Another common fault with connectors for batteries, as ordinarily made, is their liability
35 to be quickly destroyed by the action upon them of acids or other substances used in the batteries. This I propose to overcome by making them of a metal or alloy which is non-oxidizable in character and not attacked by
40 acids or other substances used in batteries.

In carrying out my invention, I attach in any suitable manner to each electrode of the battery a screw-threaded and shouldered projection formed of a hard elastic non-oxidizable metal or alloy. To connect one battery
45 to the other, I take a strip or wire of some soft flexible non-oxidizable metal or alloy, provided with enlarged ends or lugs of a hard elastic non-oxidizable metal or alloy. These
50 lugs are each perforated with a hole through

which the screw-threaded projection is passed, and are tightly and rigidly held in place against the shoulders upon the screw-threaded projection by nuts, also composed of a hard elastic non-oxidizable metal or alloy. 55

In the accompanying drawings, forming part of this application, in which like parts are designated by similar letters of reference, Figure 1 represents one of the electrodes of a battery with the screw-threaded projection attached. Fig. 2 represents the screw-threaded projection. Fig. 3 represents the flexible connecting-strip. Fig. 4 represents a nut, and Fig. 5 shows the parts as they appear when put together. Fig. 6 is a modified form
60 of the screw-threaded projection. 65

A is a bar or strip of metal, forming the terminal of the electrode B B of a battery.

C is a screw-threaded projection provided with a shoulder D, consisting of a hard elastic non-oxidizable metal, such as aluminium bronze. This screw-threaded piece is shown in detail in Fig. 2 and consists of the screw C, shoulder D, and conical-shaped part E. It may be united to the bar A by drilling a hole
70 in A, putting the conical part E into the hole so formed, and uniting the whole together by soldering the parts together, or it may be attached to the bar A by casting in any suitable manner the metal of which A is formed
80 around the conical part E, thereby firmly holding it in place. The screw-threaded piece may also be of the form shown in Fig. 6 and may be attached by soldering it onto the surface of the bar A. 85

H is a strip of a soft flexible non-oxidizable metal—such as an alloy of lead, tin, and antimony—to which is attached at each end in any suitable manner enlarged heads or lugs F F', of a hard elastic non-oxidizable metal—
90 such as aluminium bronze—and perforated with holes at G G', while a satisfactory alloy for the construction of strip H may be formed of eighty-two per cent. lead, sixteen per cent. tin, and two per cent. antimony. A nut J, Fig. 4, is provided, which is also composed of a hard elastic non-oxidizable metal, such as aluminium bronze. The parts are united together, as shown in Fig. 5. The lug F is first
95 passed over the screw-threaded projection C 100

and against the shoulder D. The nut J is then screwed onto C, binding the whole tightly and rigidly together.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the electrode of an electric battery, of a screw-threaded projection C, provided with a shoulder D, and a conical-shaped projection E, substantially as described.

2. The combination, with the electrode of an electric battery, of a screw-threaded projection C, provided with a shoulder D, and conical-shaped projection E, all composed of a hard non-oxidizable metal or alloy, substantially as described.

3. A connecting-piece for electric batteries, consisting of a strip or bar composed of a soft non-oxidizable metal, provided at each end with a head or lug composed of a hard non-oxidizable metal or alloy, substantially as described.

4. A connector for electric batteries, consisting of a screw-threaded projection C, provided with a shoulder D, in combination with a connecting-piece H, provided with lugs F and nut J, substantially as described.

5. A connector for electric batteries, consisting of a screw-threaded projection C, provided with a shoulder D, composed of a hard elastic non-oxidizable metal or alloy, in combination with a connecting-piece H, composed of a soft flexible non-oxidizable metal or alloy, said strip being provided with lugs F, composed of a hard elastic non-oxidizable metal or alloy, substantially as described.

Signed at New York, in the county of New York and State of New York, this 10th day of May, A. D. 1891.

EDWARD R. KNOWLES.

Witnesses:

E. V. MYERS,
J. B. SABINE.