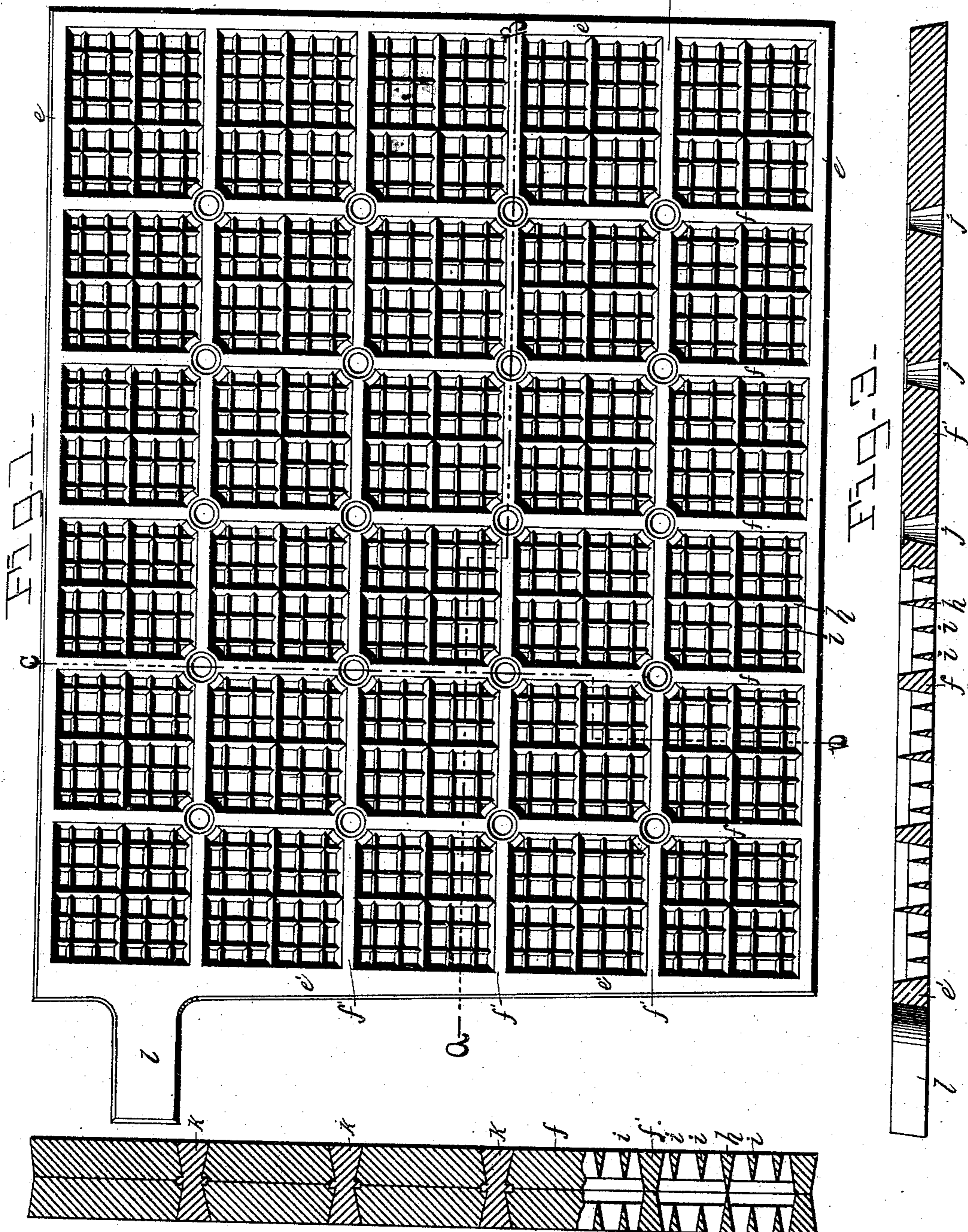


(No Model.)

S. H. BARRETT.
ELECTRODE FOR SECONDARY BATTERIES.

No. 445,872.

Patented Feb. 3, 1891.



Witnesses
J. H. Bartlett
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FIG. 2

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ELECTRODE FOR SECONDARY BATTERIES.

SPECIFICATION forming part of Letters Patent No. 445,872, dated February 3, 1891.

Application filed November 1, 1890. Serial No. 370,055. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY H. BARRETT, a citizen of the United States of America, residing in Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Secondary Batteries, of which the following is a specification, reference being had to the accompanying drawings, and letters of reference marked thereon, in which drawings like letters of reference indicate like parts.

Figure 1 is a side view of one of the grids or supporting-plates. Fig. 2 is a sectional view of two of such plates placed in position, the section being taken on line C D of Fig. 1; and Fig. 3 is a sectional view of Fig. 1, taken on line A B.

The object of my invention is to provide a grid or supporting-plate which shall be so constructed that all buckling or warping will be avoided, and wherein the active material may be firmly held in position and so constructed that the electric fluid will be readily conducted to every part of the device; and my object is also to provide a plate of such construction that two plates may be easily, readily, and firmly united together, and to provide a rapid and simple method of so uniting them.

The plate or grid may be so constructed of any of the well-known materials adapted for that purpose, and the same is cast in a mold. The outer frame *e* is provided with ribs *f*, which extend in both directions across the plate and are flush with the face of the plate, thus forming a series of strong and heavy dividing-partitions.

Each one of the squares formed by the ribs or partitions *f* is subdivided by the ribs or partitions *h*, (the sides of which partitions are inclined, as shown in the drawings,) and these inner squares or portions are again subdivided by the partitions *i*, the sides of which are also inclined, and the inner edges of which lie below the face of the plate, thus forming a series of tapering recesses which are smaller at the outer face of the plate and larger at the inner face, which openings extend but a portion of the distance toward the inner face, and are then merged in the larger openings formed by the partitions *h*, so that when the

active material becomes packed therein in any well-known manner it is divided into a series of squares of the size of the openings formed by the ribs *h*, and having also a series of projections of a size and shape to fill the openings formed by the partitions *i*. This arrangement I find produces a result far superior to any of the old forms of construction, wherein the separate smaller openings in each plate register with like small openings in the plate and extend from side to side of the two plates when together.

At the junction or intersection of the ribs or partitions *f* I cast tapering openings, as shown at *j*, Fig. 3, and after the plates or grids are completed they are placed face to face with the vertex of the angles formed by the inclined sides of the partitions toward each other, and while held firmly in position I pour molten lead or other like material in the openings *j*, which, upon solidifying, forms a rivet in each of the openings, as shown at *k*, Fig. 2, the tapering sides of which rivets will effectually prevent a separation of the plates.

To facilitate the casting of the rivets *k* in position, I provide a funnel-shaped guide or tray having several openings through it, which openings register with the rivet-openings in the plates, and upon its being placed in position and the molten metal poured therein it flows into the openings *j* until the same are filled, and then before the metal becomes fully hardened the device is moved to one side, thus leaving the top of the rivets formed by the molten metal smooth and flush with the face of the plate and rendering the rivets in fact an integral part of the plate. The edges of the plates are then united by running a heated iron around the plates at the line where the plates come together, thus slightly melting the metal and causing the edges thus melted on the heating device being removed to harden or solidify in one mass, thus rendering the outer rims or frames integral.

The conducting-wires are attached to the binding-post *l*, and the part *e'* of the outer frame *e* is made tapering, being wider at the portion upon which the post *l* is mounted and gradually tapering toward the edge of the plate. The object of this construction is to

provide a large conducting-surface at the end of the plate, through which the current must flow, so that all parts of the plate may be affected in the same manner, while if such large
5 conducting-surface were not provided the tendency would be for the current to be concentrated at or near the base of the post *l* and the plate at this point be burned out or otherwise injured, while the portion of the
10 plate at the side remote from the post *l* would be but slightly affected.

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

15 1. A secondary-battery element-plate consisting of a frame provided with a series of dividing ribs or partitions which are flush with the face of the plate, which divide the frame into a series of openings, and a series
20 of partitions or ribs flush with the outer face of the plate and below the inner face of the plate, which subdivide the above-mentioned openings into a series of lesser openings, substantially as shown.

25 2. The combination of an outer frame *e*, a

series of dividing ribs or partitions *f f'*, a series of intermediate partitions *h*, and a series of intermediate partitions *i*, the latter being of less height than the former, substantially as shown. 30

3. The combination of a frame *e*, partitions *f f'*, intermediate subdividing-partitions, a series of taper openings *j*, and uniting-rivets *k*, cast therein, substantially as shown.

4. A secondary-battery plate having its
35 portion to which the binding-post is attached tapering, being widest at the post and tapering to the edge of the plate, substantially as shown.

5. The combination of an outer frame *e*, 40 ribs *f* and *f'*, intermediate taper ribs *h*, and subdividing taper ribs *i*, the inner edges of the latter being below the plane of the inner face of the plate and the two former being flush with the face of the plate on both sides, sub- 45
stantially as shown.

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Witnesses:

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