

(No Model.)

N. C. COOKSON.

ELECTRODE FOR SECONDARY BATTERIES.

No. 279,346.

Patented June 12, 1883.

Fig. 1.

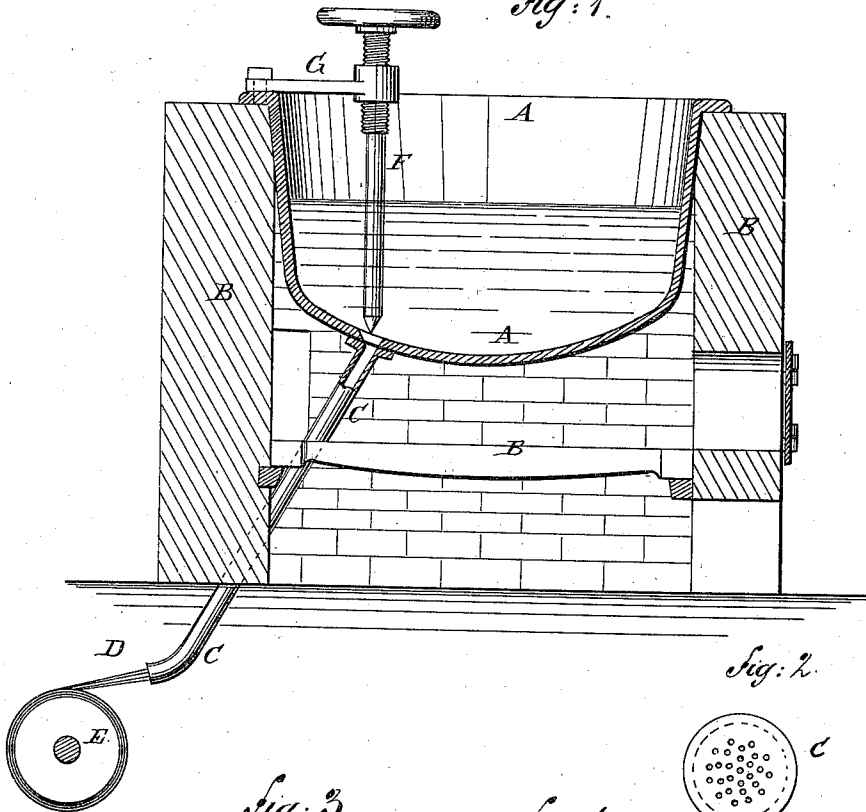
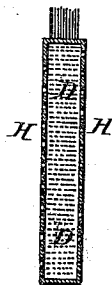
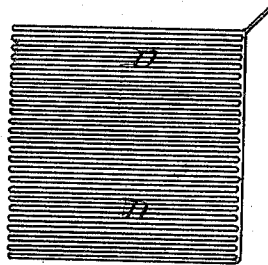


Fig. 2.

Fig. 3.

Fig. 4.



WITNESSES:
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ELECTRODE FOR SECONDARY BATTERIES.

SPECIFICATION forming part of Letters Patent No. 279,346, dated June 12, 1883.

Application filed October 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, NORMAN CHARLES COOKSON, of Newcastle-upon-Tyne, in the county of Northumberland, England, have invented a new and useful Improvement in Electrodes for Secondary Batteries, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the apparatus used in the manufacture of my improved plates. Fig. 2 is an end view of the discharge-pipe, enlarged. Fig. 3 is a side elevation of the layer of coiled wires for one of my improved plates. Fig. 4 is a sectional elevation of one of the plates.

The invention consists in combining a folded layer of fine leaden wire with a perforated leaden sheet having a tongue, so that the tongue and wire end or ends will be brought together and form a pole, as hereinafter described.

A represents a vessel set in a furnace, B, or exposed in any suitable manner to such a heat as will melt the lead placed in the said vessel and maintain it in a melted condition, the said heat-applying apparatus being so constructed as to allow the heat to be regulated to keep the lead at a uniform temperature. I prefer to use a vessel of such a depth as will contain a considerable quantity of lead for the double purpose of keeping the lead at a more uniform temperature, and to cause the lead to exert a considerable pressure upon the bottom of the said vessel.

In or near the bottom of the vessel A are formed one or more apertures, in which are secured the upper ends of one or more pipes, C. The lower ends of the pipes C are closed, and in the said closed ends are formed a number of small perforations, as illustrated in Fig. 2, through which the lead is forced in small streams by the weight of the lead in the vessel A. The streams of lead are solidified as they enter the air, so as to form groups of fine lead wires, D, which are received upon and coiled around a drum, E, rotated by hand or by suitable mechanism at a speed equal to

the velocity at which the lead escapes from the perforations in the closed end of the pipe C.

If desired, the streams of lead can be discharged into water or other cooling fluid; but I prefer to discharge them into the air, as producing a better effect.

If desired, the discharge perforations can be formed in the body of the vessel A; but I prefer to use the pipe C as being more convenient. The pipe C is provided with a plug, F, passing through a screw-hole in the arm G, attached to the vessel A, or other suitable support, so that the said pipe C can be closed and the outflow of the lead stopped when desired; or the pipe C can be provided at any desired point of its length with a stop-cock or other suitable means for stopping the outflow of the lead. When a number of pipes, C, are used, they can be so arranged that the streams of lead will cross each other, so as to form a net-work or fabric of fine lead wire, which fabric can be received upon a drum in the manner hereinafter described. The lead wire D thus formed is unwound from the drum E, is coiled or folded into a layer, and is secured together by being attached to a single plate of sheet-lead, H, or interposed between two plates of sheet-lead, H, or by being inserted in the fold of a plate of sheet-lead bent into U shape, or by strips of sheet-lead, which plates of sheet-lead should be perforated with numerous holes to allow the battery-liquid to pass through freely. One or both ends of the lead wires D and a tongue or strip of the plate H are brought together to form a pole of the battery. Plates thus formed will expose a very large lead surface to the action of the electric current. The layer of lead wire can also be formed by slipping the coil of wires D from the drum E and attaching it to the sheet-lead plate or plates. The layer of lead wires can be consolidated or packed, before being attached to the sheet-lead, by pressure between rolls or by other suitable means.

I am aware that is not new to form an electrode of straight leaden strips alternating with corrugated or plaited strips, said strips being held by a surrounding thicker strip and rubber rings, or to connect the wires of an electric generator with one or more pairs of leaden

plates having perforations filled with granules of chemically pure lead, said leaden plates being separated by non-conducting material and placed in a bath of acidulated water; but

5 What I claim as new and of my invention is—

In secondary batteries, a coil or folded layer of fine leaden wire, combined with a perforated

leaden sheet, H, provided with a tongue, the said tongue and end or ends of the wire being brought together to form a pole, as described.

NORMAN CHARLES COOKSON.

Witnesses:

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