

(No Model.)

2 Sheets—Sheet 1.

R. J. GÜLCHER.
SECONDARY BATTERY.

No. 562,396.

Patented June 23, 1896.

Fig I.

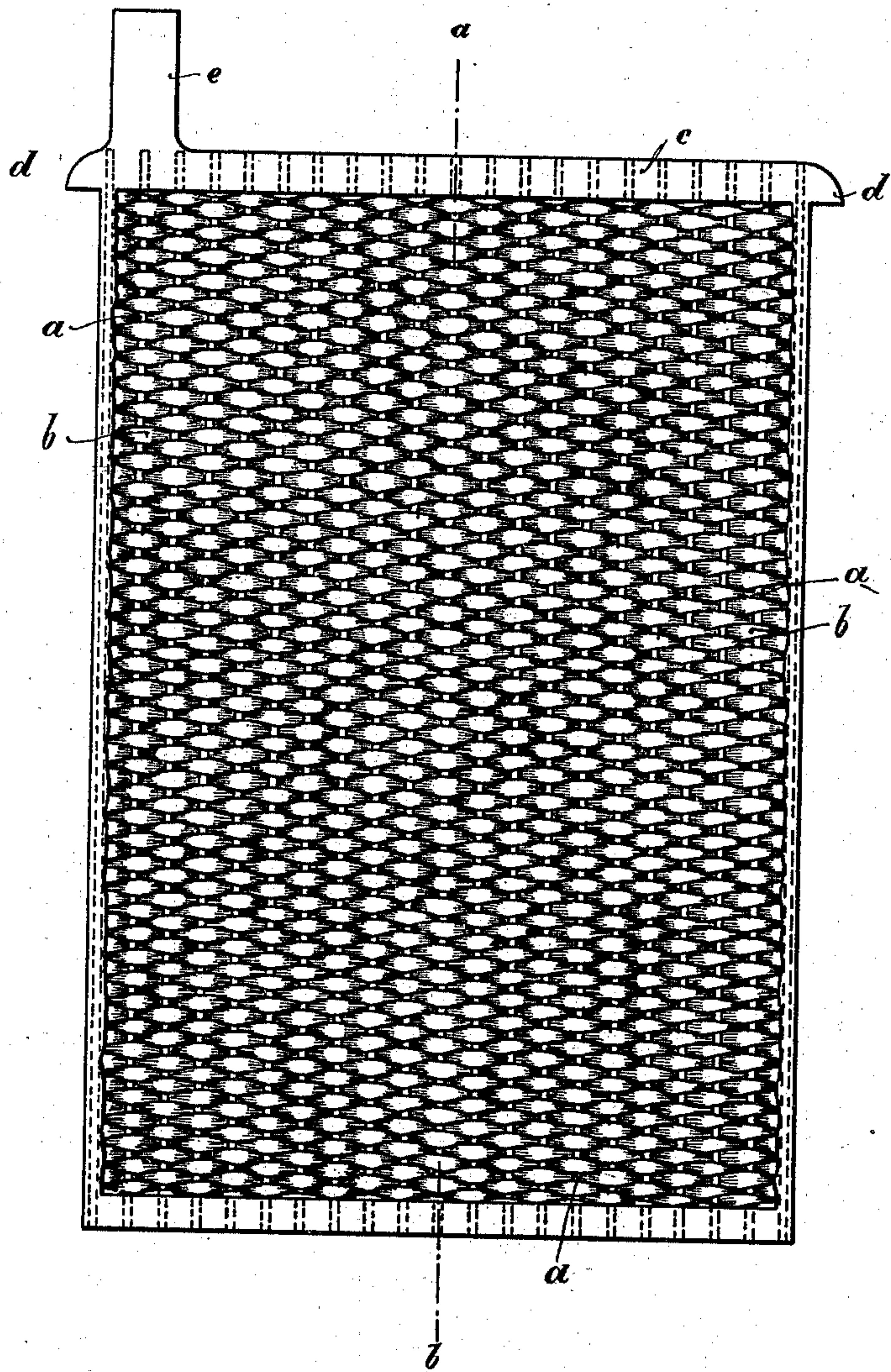
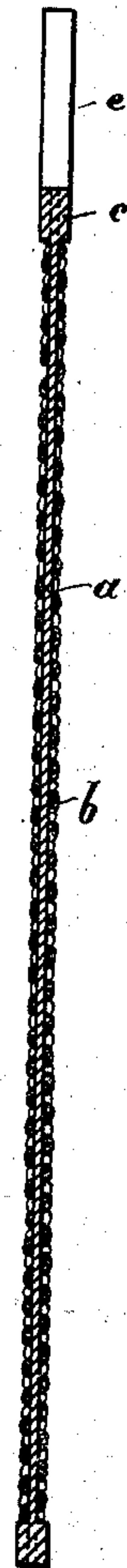


Fig II.



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Fig. III.

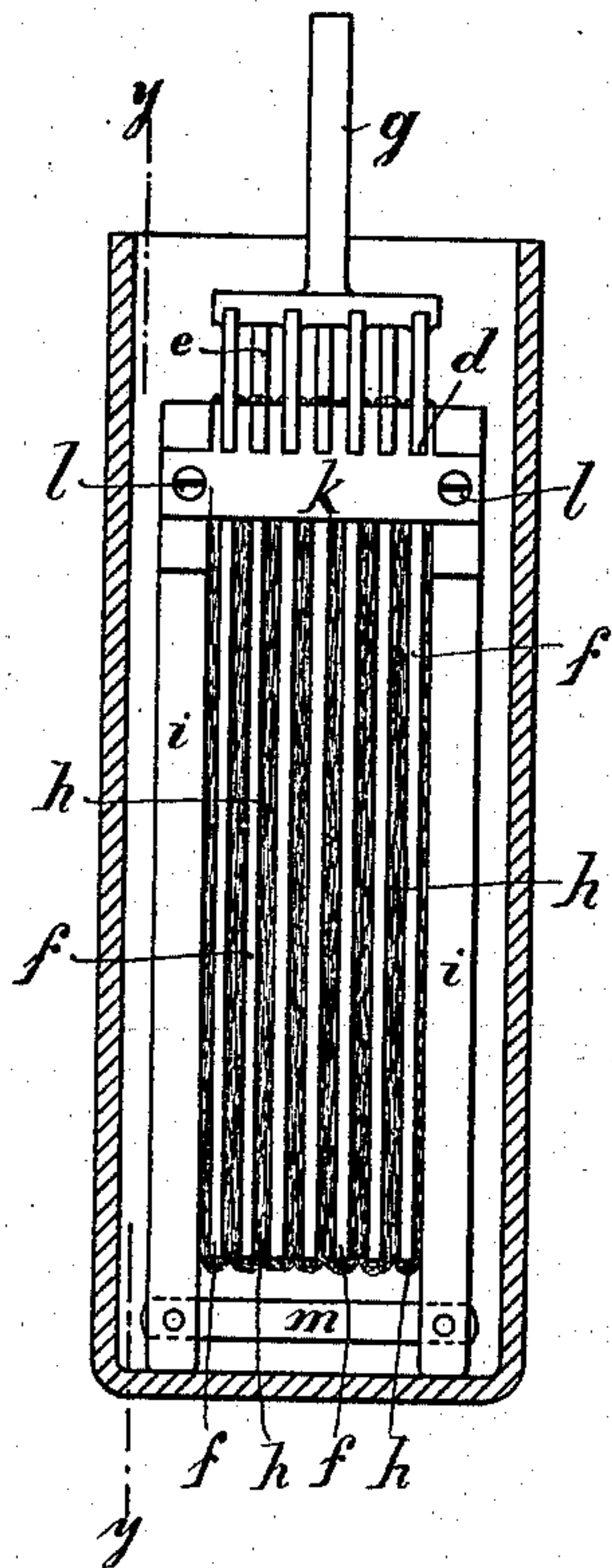
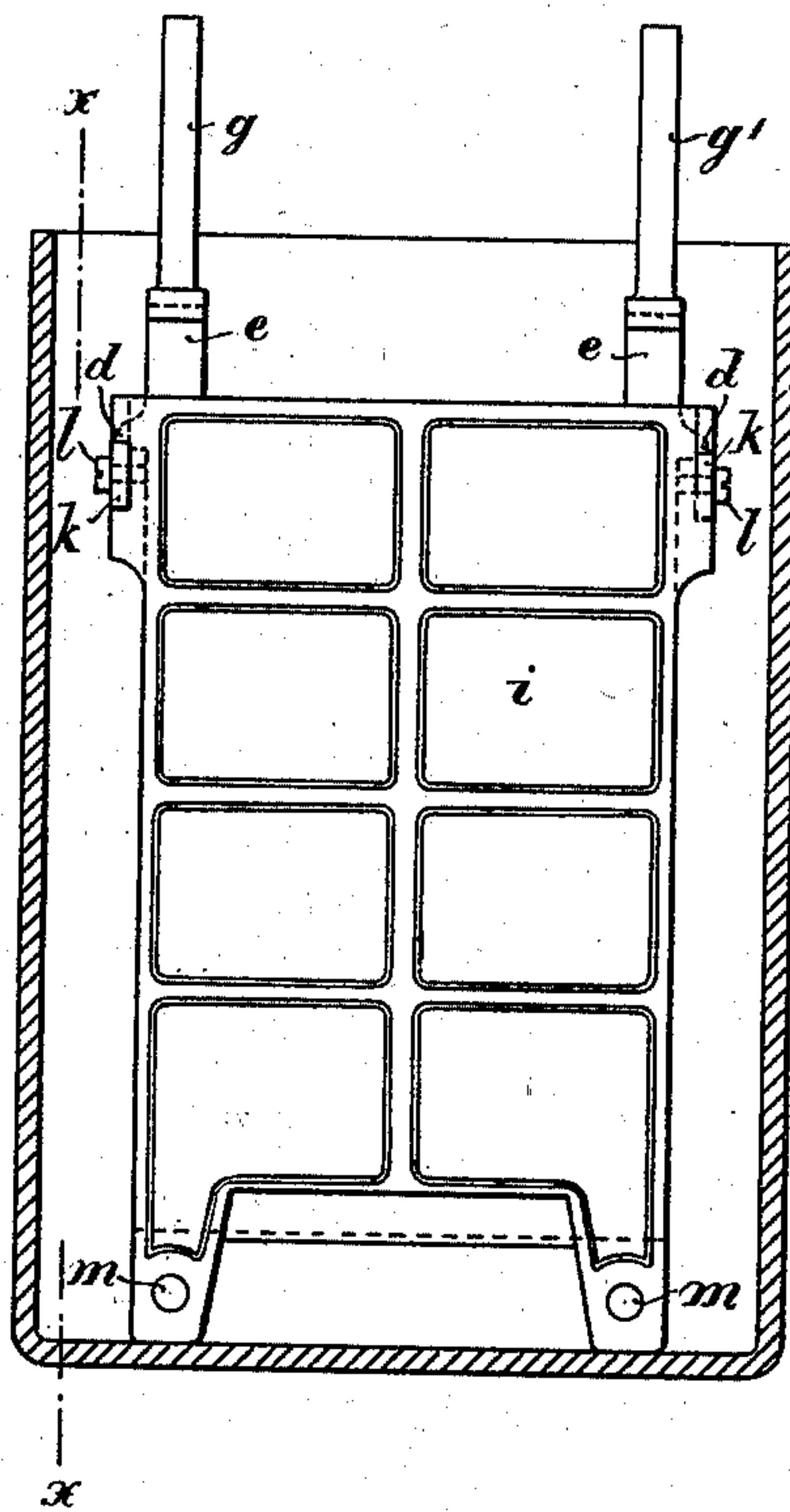


Fig. IV.



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UNITED STATES PATENT OFFICE.

ROBERT JACOB GÜLCHER, OF CHARLOTTENBURG, GERMANY.

SECONDARY BATTERY.

SPECIFICATION forming part of Letters Patent No. 562,396, dated June 23, 1896.

Application filed February 29, 1896. Serial No. 581,299. (No model.)

To all whom it may concern:

Be it known that I, ROBERT JACOB GÜLCHER, a subject of the King of Prussia, German Emperor, residing at the city of Charlottenburg, near Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Secondary Batteries, of which the following is a specification.

My invention relates to the construction of electrodes and their arrangement in a current-accumulator.

The carrier of the active mass consists of a fabric, the warp of which is made up of lead threads and the woof of spun glass or quartz threads.

In the drawings, Figures 1 and 2 show the carrier. Figs. 3 and 4 show the electrodes in the battery. Fig. 2 is a section on the line *a b* of Fig. 1.

The carriers are constructed as follows: The lead threads *a* (in a number corresponding to the width of the electrode) are drawn over a suitable loom as a "warp" and interwoven with skeins of spun glass or quartz threads as a "woof." After a suitable length of such fabric has been made it is cut in pieces corresponding with the size of the electrode. A short piece at the top and bottom of the lead threads is then uncovered and inserted in specially-constructed molds, in which melted lead is cast around the free extremities of the threads and preferably, also, at the two sides forming a frame. Thereby an intimate combination will be produced between the lead thread ends which will partly melt and the melted lead, which extremities serve for the conducting and uniform distribution of the electric current. The upper edge of the lead frame is preferably given the shape of a ridge *c*, with the two hooks *d* and a post *e*. The hooks *d* serve for hanging the electrodes, while the post *e* serves

as a conducting connection between the electrodes and the polar extremities of the accumulator.

The electrodes are combined in a battery, as shown in Figs. 3 and 4. Fig. 3 is a section on the line *x x* of Fig. 4, and Fig. 4 is a section on the line *y y* of Fig. 3.

The electrodes *f* are arranged in a well-known manner in two groups, the positive and the negative groups, each of which ends in a conducting-strip *g g'*. The single electrodes are covered with a layer of spun glass and placed between two uprights *i*, of an insulating material, which carry the electrodes *f*, covered with spun glass, and at the same time press them together in such a manner that they are in flexible contact. The two upright plates *i* are connected at the top by the plates *K*, of insulating material, supporting the two hooks *d* of the electrodes. The plates *K* are connected with the upright plates *i* by means of screws *l*. Below the electrodes the upright plates *i* are connected by rods *m*, fixed to said plates by means of pins. The entire device is then put in a proper vessel and plunged into the electrolytic liquid.

I claim—

1. Electrodes for electric accumulators comprising a fabric made of lead threads as warp and glass or quartz threads as woof, and a frame of lead, substantially as described.

2. An electrode comprising the fabric of lead and glass thread, the frame therefor, and the covering of spun glass, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ROBERT JACOB GÜLCHER.

Witnesses:

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W. P. TYLER.