No. 843,549. PATENTED FEB. 5, 1907.

H. P. R. L. PÖRSCKE & G. A. WEDEKIND.

RECEPTACLE FOR ELEMENTS.

APPLICATION FILED JULY 25, 1904.

2 SHEETS—SHEET 1.

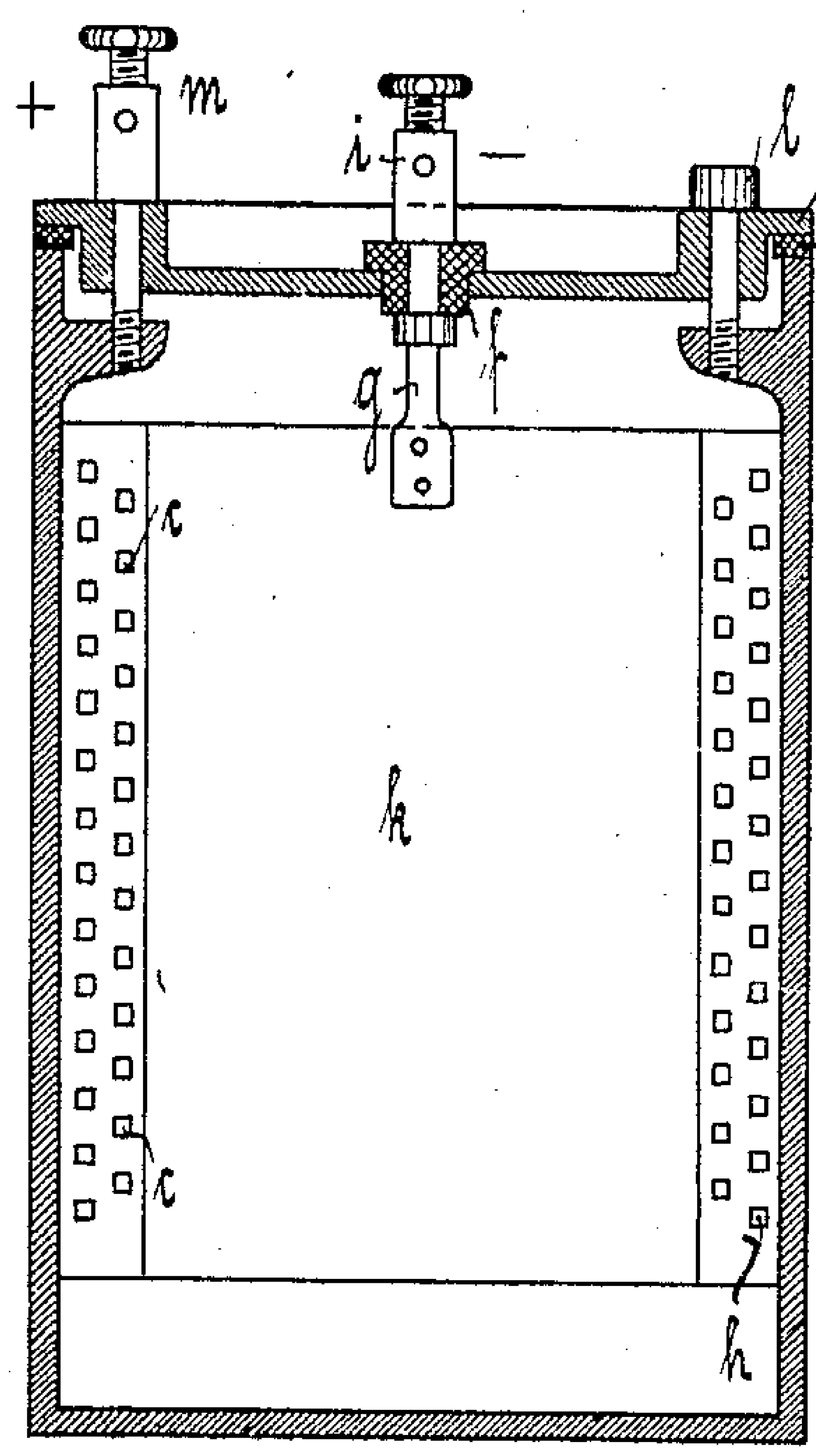

Fig. 1

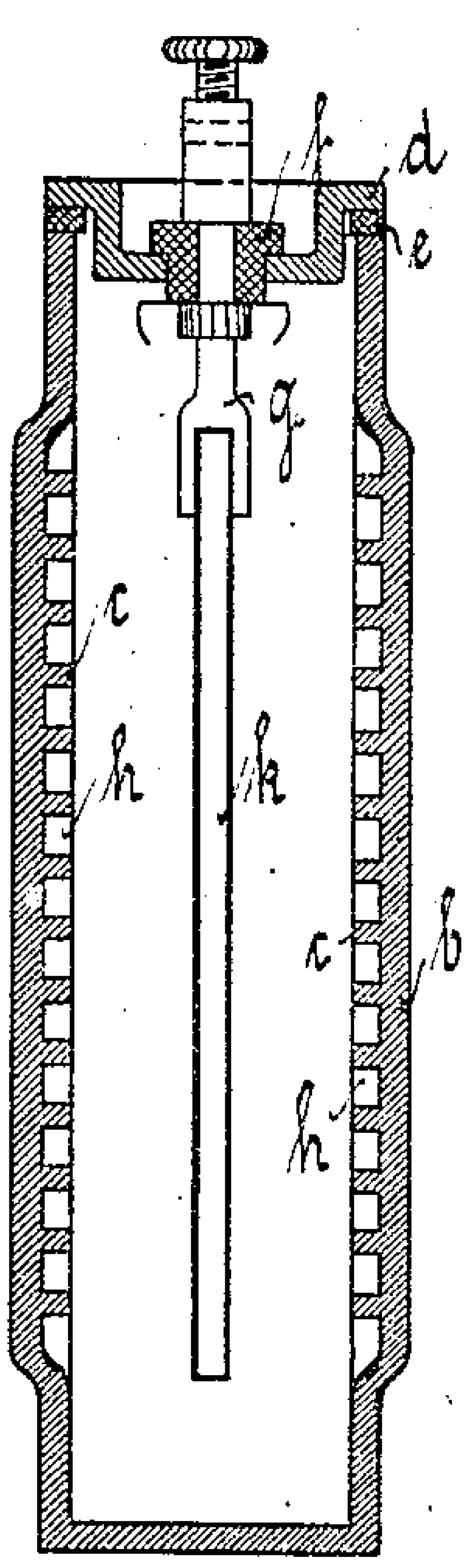

Fig. 2

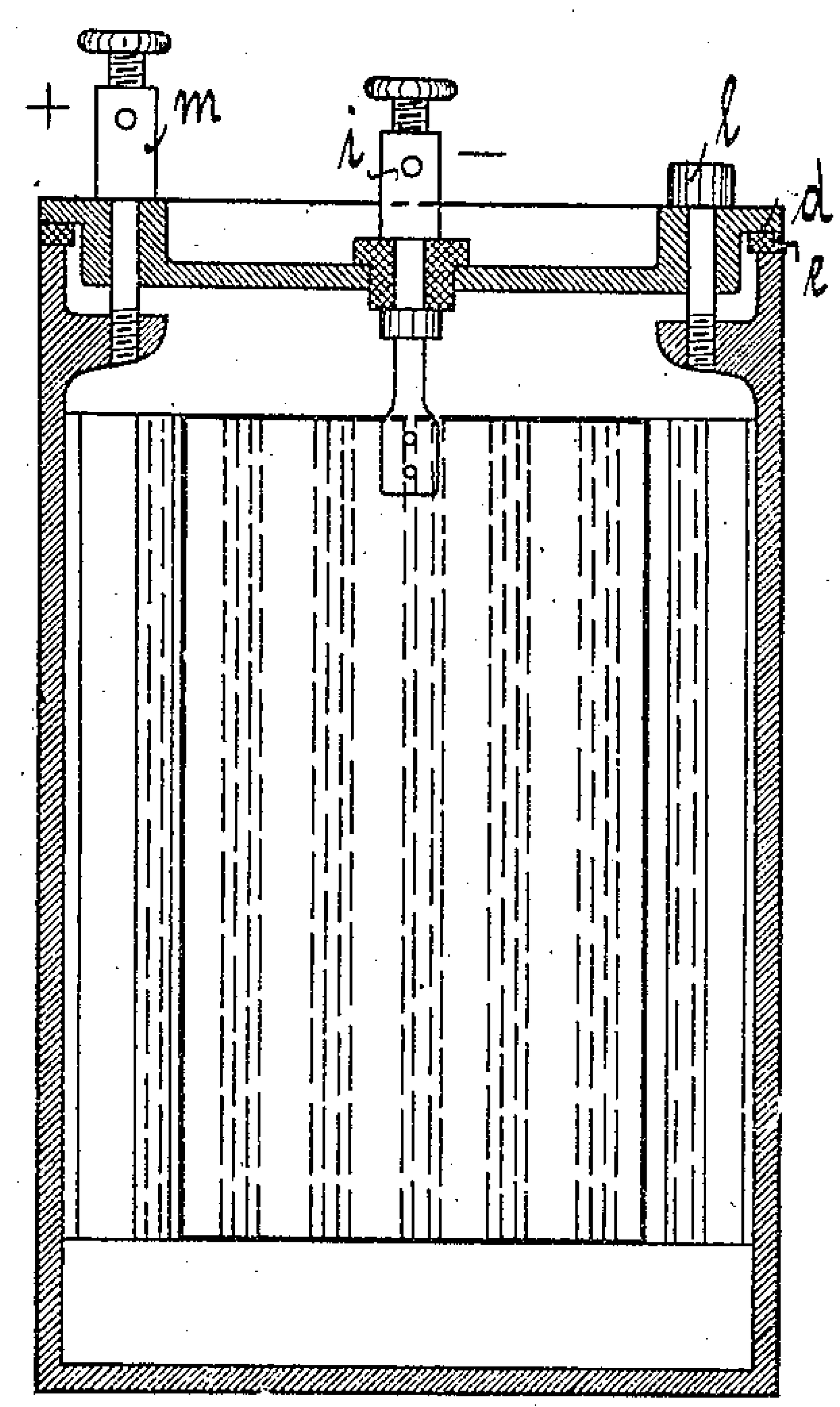

Fig. 4

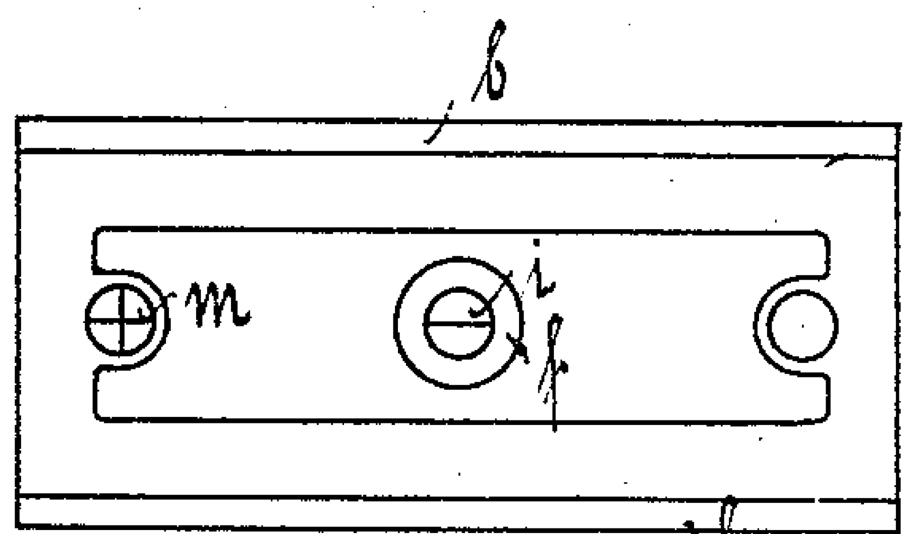

Fig. 3

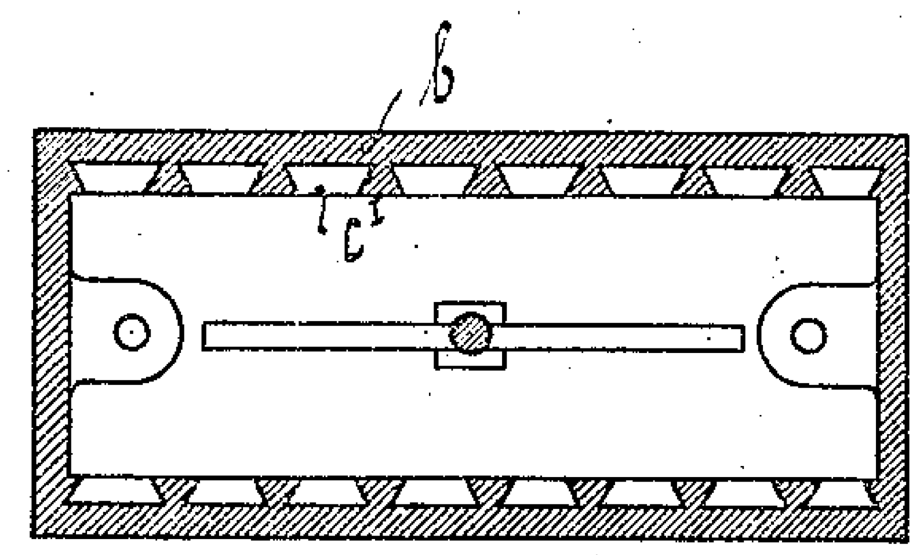

Fig. 5

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2 SHEETS—SHEET 2.

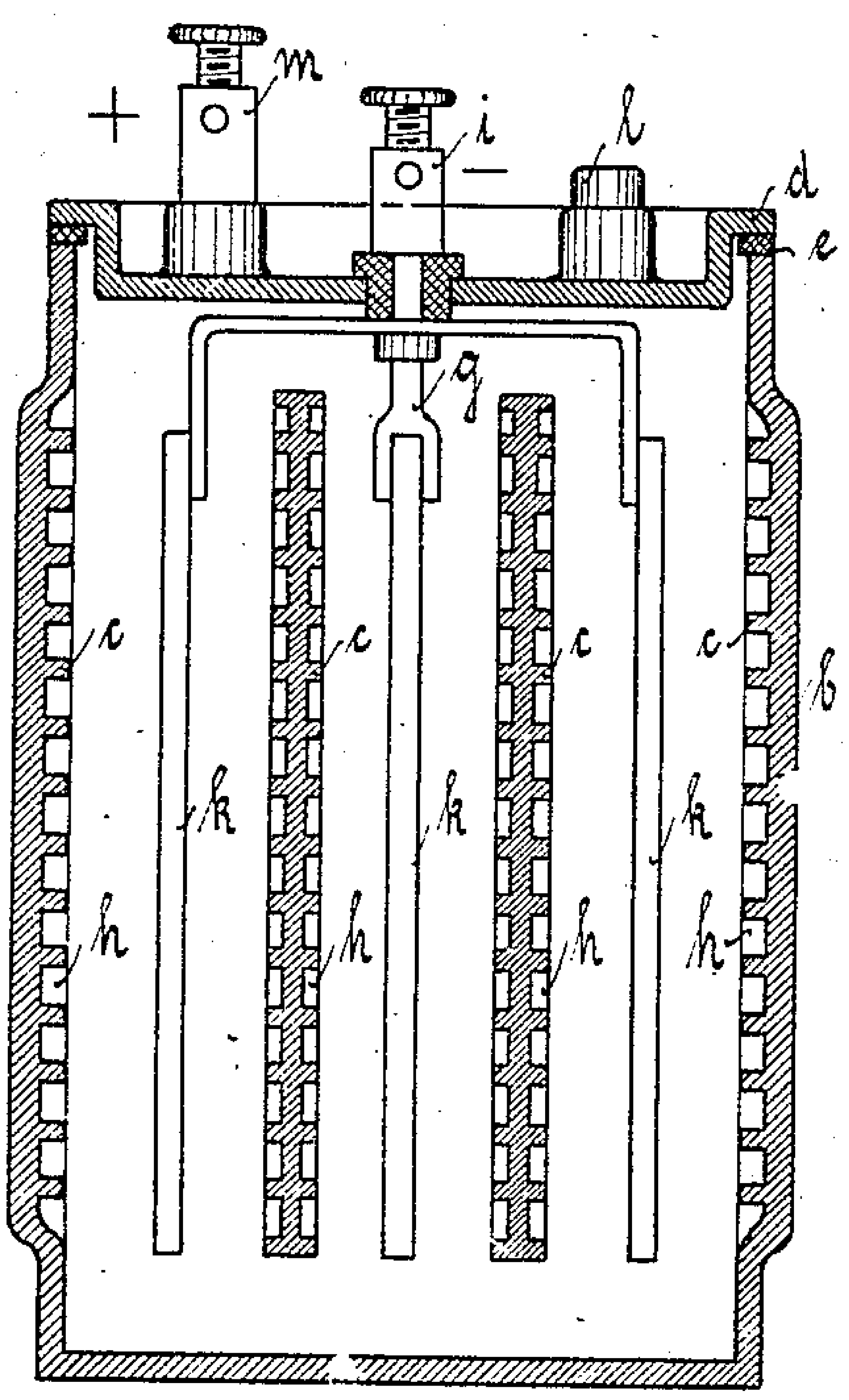

Fig. 6

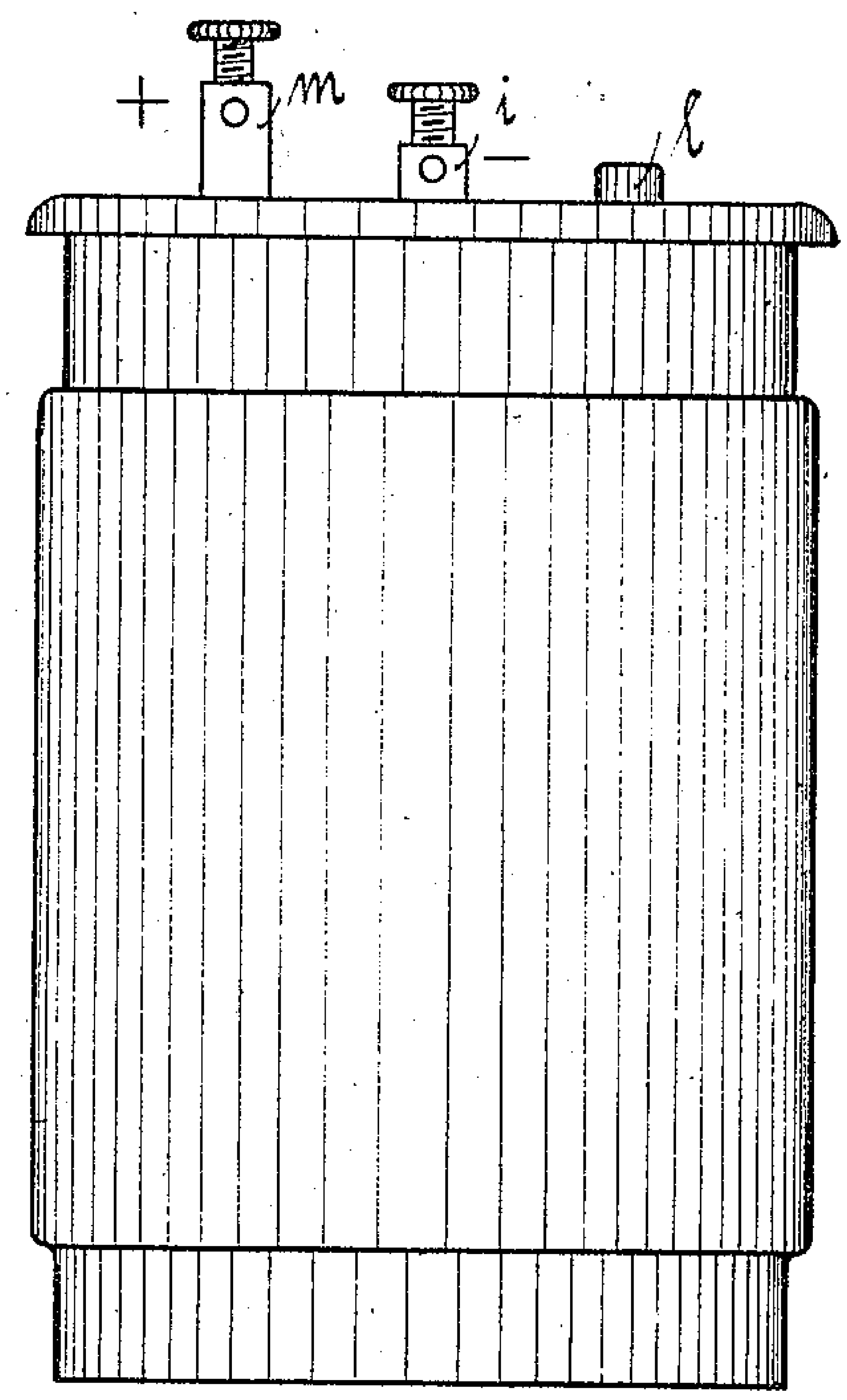

Fig. 8

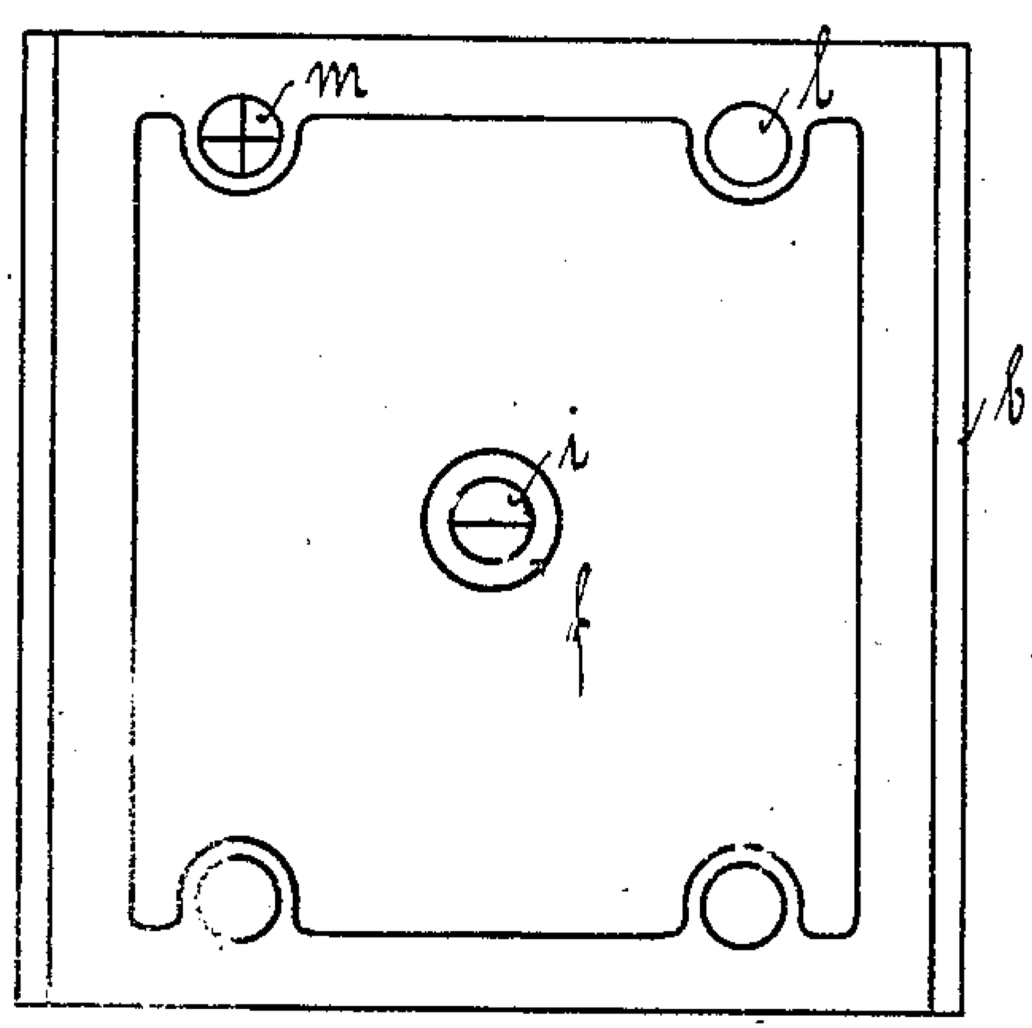

Fig. 7

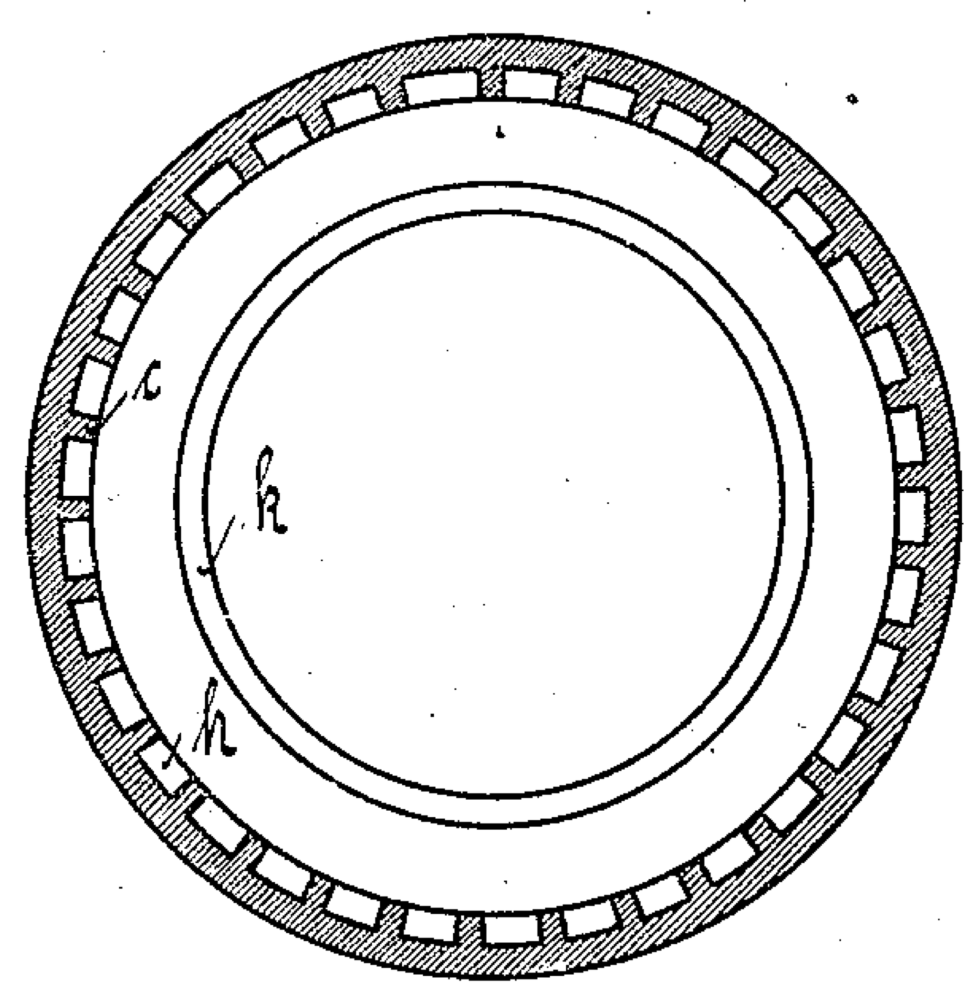

Fig. 9

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UNITED STATES PATENT OFFICE.

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RECEPTACLE FOR ELEMENTS.

No. 843,549. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed July 25, 1904. Serial No. 218,156.

To all whom it may concern:

Be it known that we, HEINRICH PAUL RUDOLF LUDWIG PÖRSCKE and GUSTAV ADOLPH WEDEKIND, citizens of Hamburg, and residents of Hamburg, Germany, have invented certain new and useful improvements in receptacles for elements made of cast-iron, bronze, copper, or steel, the walls and partitions of which are so shaped as to afford support to the reducing agent, for example, oxid of copper, of which the following is a specification.

Receptacle for elements made of cast-iron bronze, copper, or steel, the walls and partitions of which are so shaped as to afford support to the oxidizing agent—for example, oxid of copper.

The receptacles usually employed in connection with elements with alkaline electrolytes—such, for instance, as belong to the types copper, zinc, alkali—are boxes constructed either of glass or of sheets of steel with the electrodes so hung or built in the walls of the cell as to be insulated; but this method of fixing the electrodes within the cell presupposes a certain amount of technical knowledge on the part of the people looking after the apparatus. Consequently it is not possible to entrust the task of regenerating the elements to laymen. Moreover, when elements of the type copper, zinc, alkali have to be regenerated it often happens that the oxid-of-copper electrodes when taken out are injured, either by being allowed to drop or to being knocked about, or it may happen that the electrodes buckle when heated for the purpose of oxidizing them afresh, and that they tend consequently to short-circuit with the adjoining electrodes of opposite polarity when replaced in the cells. Another well-known form of constructing a cell is that adapted by Lalande. In this case powdered oxid of copper is placed at the bottom of an iron vessel or of a cast-iron shell. The method employed for bringing the oxid of copper in contact with the bottom of the receptacle is, as will be easily seen, the worst which could have been adopted. Moreover, if Lalande's construction is adopted part of the hydrogen will act, polarizing as it collects all over the inner surface of the iron receptacle, and therefore the hydrogen will become very slowly absorbed. Compare, further, Carhart, Schoop, *Primary Elements*, 1895, page 75, last paragraph. The process of reducing the copper in a cell constructed in accordance with Lalande's method suffers, moreover, from the further disadvantage of being very complicated, as after the reduction process has been completed the alkaline lye, or, to be more accurate, the alkaline zincate, having been poured off the copper which is found lying at the bottom, has to be washed thoroughly and then the copper has to be subjected to a considerable degree of heat for the purpose of oxidizing it afresh. All these disadvantages have been overcome by the adoption of the construction to which this description refers. Therein the inside walls of the cells or a number of partition-walls which may either be run in, screwed in, or riveted in and which are furnished either with small projecting bolts or with grooves, are covered with the reducing agent, and as the oxid of copper adheres in a solid condition to the partition-walls, which form a kind of support for it, the hydrogen will become absorbed quickly and easily; besides, this method, adopted for bringing about the contact of the oxid of copper or of the spongy copper with the walls of the cell, possesses great practical and commercial advantages. In consequence of the arrangement adopted currents of high intensity may be obtained by means of such an element. This is not the case when Lalande's element is employed.

A further advantage of our construction, as compared with that of Lalande, consists in the simplicity with which it can be manipulated. To regenerate the element, one need only remove the zinc-plate which hangs suspended from the cover of the cell, pour out the alkaline zincate, and then subject the cell for a few hours to a moderate heat in any position. There is no need for first washing out the cell, neither is there any danger that the reduced mass of spongy copper will fall out. While in consequence of the complete contact between the oxid of copper and the walls of the cell on account of the solid spongy condition of copper situated on the bolts or in the grooves of the walls, the oxidation is effected quickly and without difficulty.

In the drawings, Figure 1 is a box in longitudinal section, the sides of which are used as bearers according to our invention. Fig. 2 is the same box in cross-section. Fig. 3 is the same box in plan view. Fig. 4 is a longitudinal section of a box the inner sides of which are provided with grooves instead of small projections. These grooves may be of dovetail cross-section. Fig. 5 is the same box in horizontal section. Fig. 6 is a cross-section of a box with partitions. Its inner sides, as well as the partitions, are used as bearers for receiving the active matter. Fig. 7 is the same box in plan view. Fig. 8 is an elevation of a round box the inner side of which is provided with small projections for receiving the active matter. Fig. 9 is the same box in horizontal section.

Referring to Figs. 1, 2, and 3, A represents a box, made of cast-iron, bronze, copper, or cast-steel, the long sides *b* of which may be slightly bulged, as shown, to receive the active matter. The partitions electrically connected with the box will be filled with the active matter. The bulged sides *b* and the partitions are provided at the inner sides with small projections *c* or, for instance, with grooves *c'*. A cover *d*, either bolted in, pressed in, or fixed in any other way and provided with an india-rubber washer *e*, hermetically closes the box. A hole is drilled in the cover, where a vulcanite bushing *f* is inserted. Through the hole of the vulcanite bushing *f* passes the terminal *g* (insulated from the box and the cover) of the electrode *k*, which has the contrary polarity to the active matter *h*, placed in the sides of the box. A screw-bolt *l* of the lid, electrically connected with the box, forms at the same time a clamp or binding-post *m* and serves as positive electrode for the active matter *h* in the box electrically connected with it. The derivation (escape of the current) of the, we will say, zinc electrode *k*, supported over the cover and insulated by the vulcanite bushing, which electrode is of contrary polarity to the matter placed in the grooves of the box, is effected by the binding-post *i*, which is to be screwed on the support *g*, depending from the vulcanite bushing *f*.

The element is made ready for use by filling the tank or receptacle with electrolyte, suspending the insulated electrode of contrary polarity from the cover, and bolting on the cover of the box. The regeneration is effected by lifting and putting aside the cover after unbolting or loosening it, together with the insulated plate suspended therefrom having the contrary polarity—as, for instance, zinc—then by pouring out the electrolyte, and finally by warming the tank which contains the active matter or drying it in the open air. Hereafter the element is filled again and composed in the aforesaid manner.

We claim—

1. The battery-container electrode, having walls of cast-iron bulging outwardly to coöperate with the opposite electrode, a plurality of dovetailed holding projections formed on the inside of said bulging walls and hardened, coherent copper oxid material on said walls engaging said projections forming a substantially flush surface.

2. The battery-container electrode formed of cast-iron and having inner walls provided with a plurality of holding projections and hard coherent copper oxid material on said walls engaging said projections so as to be capable of reoxidization by heating said container-electrode.

3. The battery-container electrode formed of heat-resisting conductive material and having hard coherent copper oxid material on its walls, means on the walls to hold copper oxid, so as to readily reoxidize said material by heating said container-electrode.

4. The battery-container electrode formed of heat-resisting conductive material, having hard coherent oxid material on the inner walls of said container-electrode, the melting-point of said electrode being higher than the temperature of reoxidization of said oxid material, so that said oxid material may be readily reoxidized by heating said container-electrode.

5. The battery-electrode formed of heat-resisting conductive material and provided with holding projections and having hard coherent copper oxid material on its walls the melting-point of said electrode being higher than the temperature of reoxidization of said oxid material, so that said oxid material may be readily reoxidized by heating said electrode.

6. The battery-electrode formed of heat-resisting conductive material, and having hard coherent oxid material on its walls, means on the walls to hold said oxid material, the melting-point of said electrode being higher than the temperature of reoxidization of said oxid material, so that said oxid material may be readily reoxidized by heating said electrode.

7. The battery-container electrode, having walls of cast-iron, a plurality of dovetailed holding projections formed on the inside of said walls and copper oxid material on said walls engaging said projections, forming a substantially flush surface.

8. The battery-container electrode formed of heat-resisting conductive material and having walls serving as a support for hard coherent copper oxid material.

9. The battery-container electrode formed of heat-resisting conductive material having walls bulging outwardly to coöperate with the opposite electrode and a plurality of holding projections formed on the inside of said bulging walls, and hard coherent oxid material on said walls engaging said projections forming a substantially flush surface, the melting-point of the electrode being higher than that of the oxid material.

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Witnesses:
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