

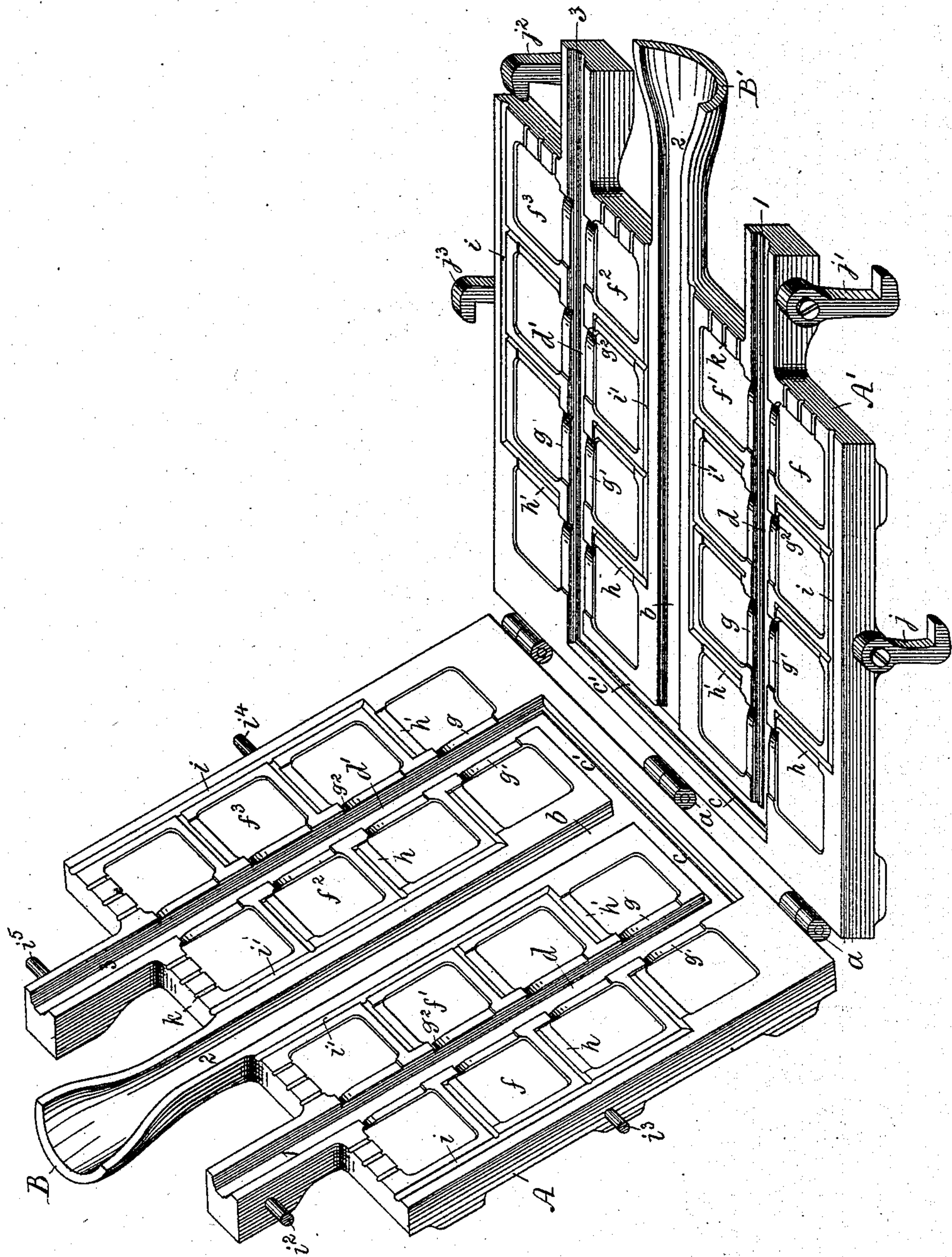
(No Model.)

W. SHAPLEIGH.

MOLD FOR CASTING THE PLATES OF STORAGE BATTERIES.

No. 413,309.

Patented Oct. 22, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

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MOLD FOR CASTING THE PLATES OF STORAGE-BATTERIES.

SPECIFICATION forming part of Letters Patent No. 413,309, dated October 22, 1889.

Application filed July 2, 1889. Serial No. 316,334. (No model.)

To all whom it may concern:

Be it known that I, WALDRON SHAPLEIGH, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Molds for Casting the Plates of Secondary or Storage Batteries, of which the following is a specification.

My invention relates to a mold for casting the plates of secondary or storage batteries.

A plate to form an element of a secondary or storage battery having as its principal constituent a salt of a metal, as chloride of lead, is difficult to cast solid, owing to the fact that such material contracts considerably, thereby leaving hollow spaces within the body of the plate, and then air-bubbles are apt to be formed therein, both of which greatly impair the utility of the plate for subsequent use.

The principal object of my invention is to obviate the said objectionable features and results encountered and to provide a two-part mold adapted to receive a material or substance to become cast into plates therein prior to these plates being mounted in another mold to have cast around them a frame of good conducting material to form by subsequent treatment a plate or element of a secondary or storage battery.

My invention consists of a mold constructed so as to be rapidly filled from the bottom in an upward direction, thereby permitting air to escape from the top of the series of matrices of the mold through, preferably, knife-edge channels communicating with larger channels. The material or substance is introduced through a funnel-shaped feed-channel communicating with oppositely-disposed risers, and through knife-edge channels into the two series of matrices of the mold. The knife-edge channels by preference near the upper ends of the respective matrices are enlarged, in order that as the material or substance becoming cast into plates therein cools and contracts they may suck in sufficient material from the risers to fill up any space that may have been formed by the contraction of the series of plates. Between the series of matrices the horizontal channels for the escape of air communicates with vertical main air-

channels located on each side of the matrices of the mold and extending to the top of the mold.

The nature and characteristic features of my invention will be more fully understood by reference to the accompanying drawing, showing my improved two-part mold in open position.

Referring to the drawing for a further description of my invention, A and A' are the two parts of the mold hinged together at *a*. Each part of the mold is preferably made of brass or bronze of either equal or unequal thicknesses of metal.

B and B' are the sections constituting, when the mold is closed and in position for use, the funnel-shaped sprue or feed, which communicates with a central feed-channel *b*, extending downward through the mold. In the lower part of the mold the feed-channel *b* communicates with horizontal branch channels *c* and *c'*, and these latter channels communicate with vertical channels or risers *d* and *d'*, extending through and a short distance above the top edge of the mold. Adjacent to and on each side of the vertical channels or risers *d* and *d'* are provided two series of matrices *f*, *f'*, *f*² and *f*³. These matrices are in communication with the risers *d* and *d'* through knife-edged channels *g* and *g'*, which are enlarged at their upper ends *g*², in order that the material or substance becoming cast into plates in the respective matrices, and necessarily contracting to a greater or less extent therein, may suck in sufficient material from the risers *d* and *d'* to fill up any space or spaces that may be formed thereby, as well as affording a free exit for the escape of air therefrom into the risers *d* and *d'*, or through the horizontal channels *h* and *h'*, between the matrices, into the main air-escape channels *i* and *i'*.

The material or substance poured into the funnel-shaped sprue or ingate B and flowing through the central feed-channel *b* is conducted along the horizontal branch channels *c* and *c'* into the vertical channels or risers *d* and *d'*, and then flows into the respective matrices *f*, *f'*, *f*², and *f*³, and therein becomes cast into plates. The matrices of the mold may be made of any preferred size. The

mold may also be arranged so that but one or more plates are cast in the mold, instead of two series of plates, provided the arrangement of the knife-edge channels, feed-channel, sprue, and risers are suitably adhered to, as by maintaining the relative arrangement of those parts in the interior construction of the mold good results are thereby insured.

The horizontal channels h and h' , between the respective matrices and communicating with the vertical air-channels i and i' , as well as the channels g and g' , are made of less sectional area than the matrices, in order that the material becoming cast in said matrices may be readily separated or broken away.

In each side of the part A of the mold is provided lugs or pins i^3 and i^4 , and in each wall of the vertical channels or risers d and d' are formed similar lugs or pins i^2 and i^3 . To the opposite part A' of the mold are pivotally attached pawls j , j' , j^2 , and j^3 , which engage, when the two parts of the mold are closed together, with the lugs or pins i^2 , i^3 , i^4 , and i^5 .

In the upper inner edge of each part of the mold are provided a series of vent or air holes k .

When the substance or material cast in the respective series of matrices f , f' , f^2 , and f^3 has become cool or perfectly cold, the mold is unlocked and the series of plates supported by the branches 1, 2, and 3 may be readily removed therefrom and each plate parted from its neighbor, and a series of such plates then mounted in another mold of suitable construction, in order that a supporting-frame, of preferably a good conducting material, may be cast between and around the series of plates to constitute a plate to form by subsequent treatment, forming no part of my present invention, an element of a secondary or storage battery.

The particular advantages incident to the use of a mold embodying the features of my invention, and constructed as described, is, first, that the material or substance can freely flow into the matrices through the knife-edge channels g and g' from the risers d and d' in

communication with the horizontal branches c and c' of the feed-channel b , to become cast therein into plates, and upon opening the two parts of the mold the two or more series of plates on each side of the vertical channels or risers d and d' may be removed, as the substance or material that has become solid in the respective channels and risers is so connected with the edges of the series of plates as to enable their removal being effected at one operation, thereby not only saving time, but much labor and expense; second, with channels h and h' , provided between the series of matrices, any air in the form of bubbles forming in the cast plates is permitted to escape through the same into the main air-channels i and i' in vertical directions, and from the mold or through the risers d and d' in an upward direction and from the mold; and, third, by providing the knife-edge channels g and g' in communication with the matrices, the contraction of the material taking place in its becoming cast into plates is fully compensated for, and perfectly solid and uniform plates thereby insured.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

The herein-described mold for casting plates for secondary batteries, provided with a sprue or feed merging with a central channel extending through the mold and communicating with channels c and c' , and the latter merging with risers d and d' , matrices in communication with said risers through the channels g and g' , horizontal channels h and h' between said matrices and in communication with air-escape channels i and i' , and means for clamping the parts of the mold together, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

WALDRON SHAPLEIGH.

Witnesses:

GEO. W. REED,

J. WALTER DOUGLASS.