

No. 669,007.

Patented Feb. 26, 1901.

G. T. EYANSON & A. J. SHINN.  
PROCESS OF MANUFACTURING ZINC AMALGAM PLATES.

(No Model.)

(Application filed June 11, 1900.)

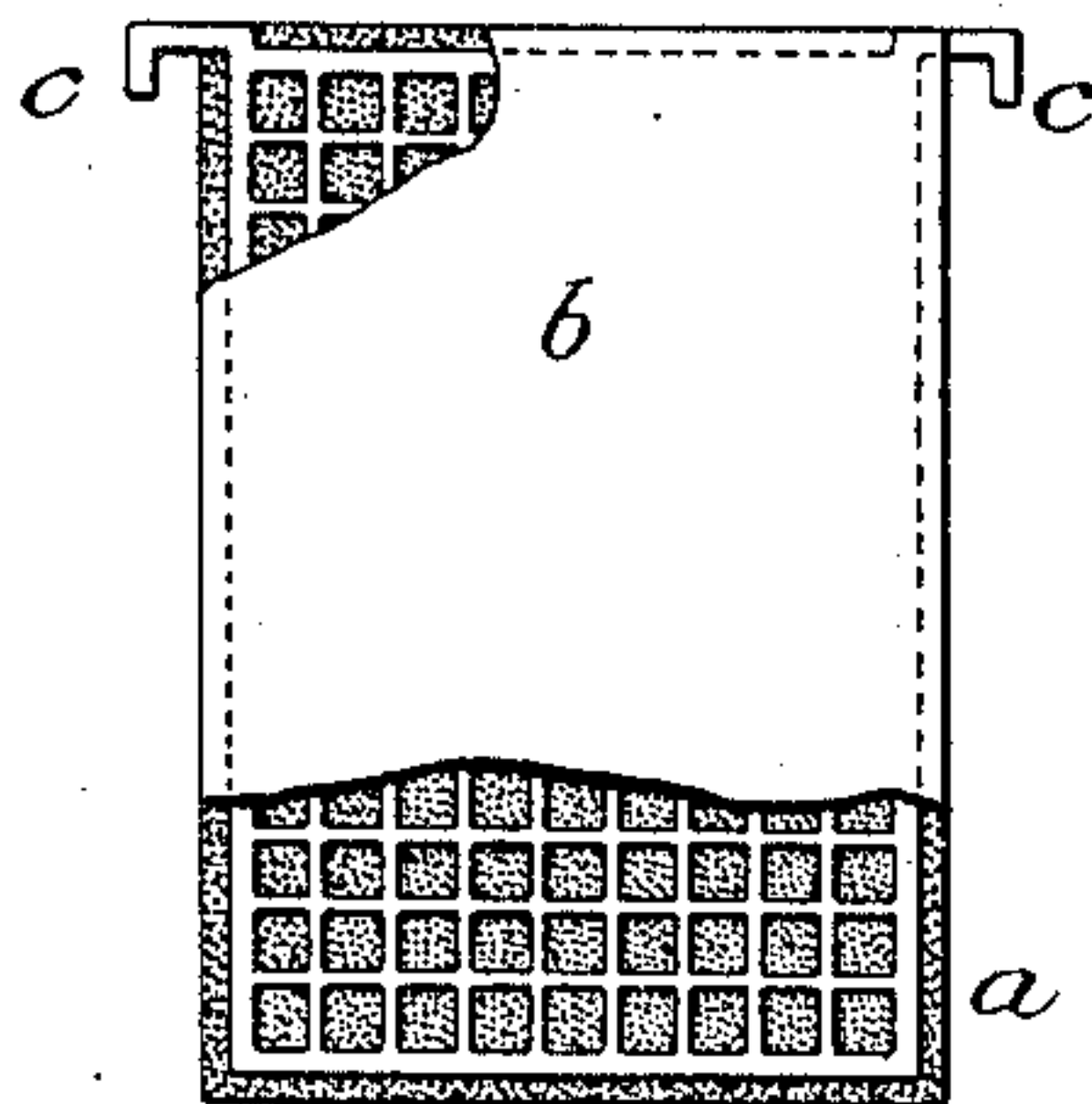


Fig. 1.

Fig. 2.

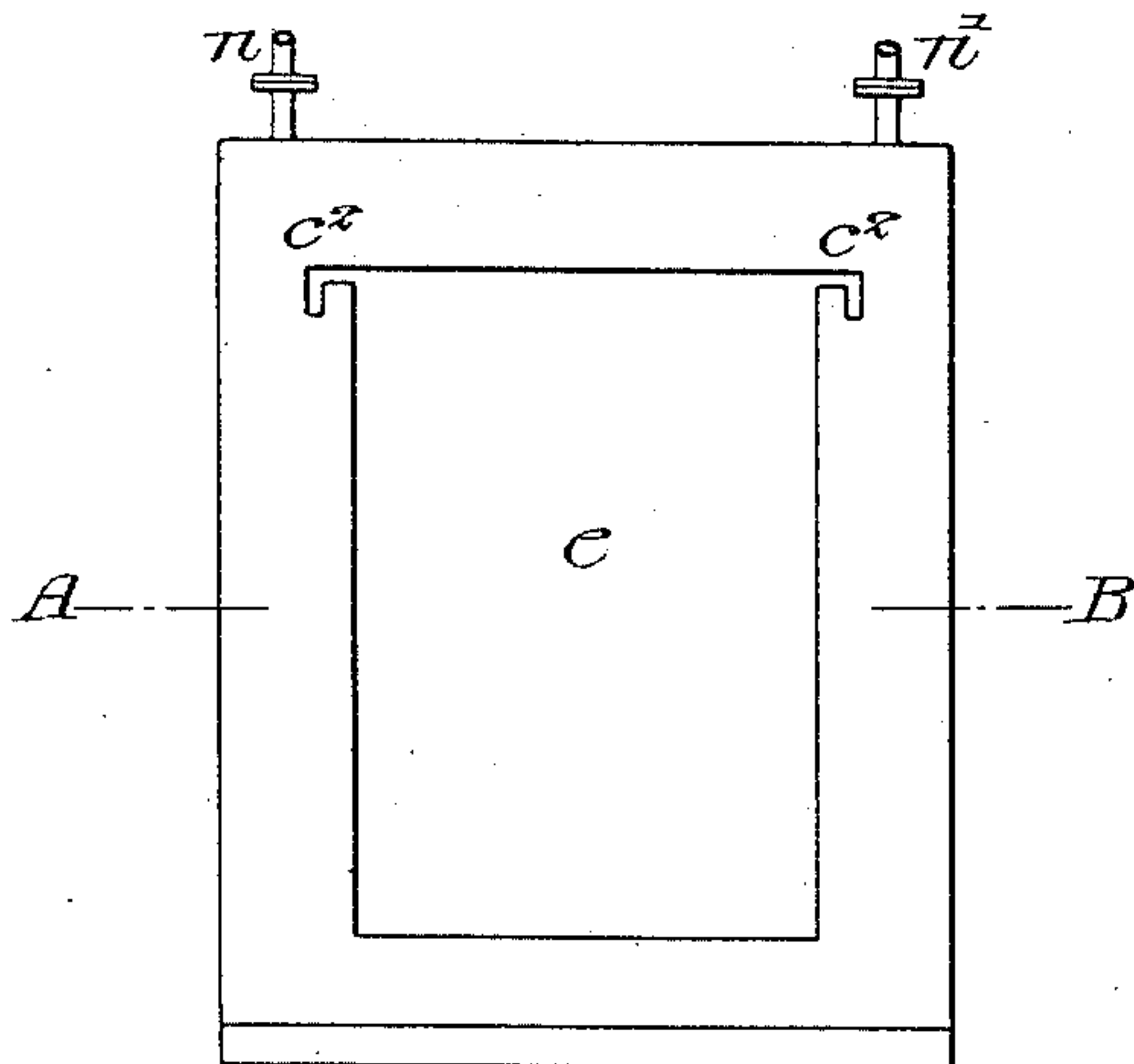


Fig. 4.

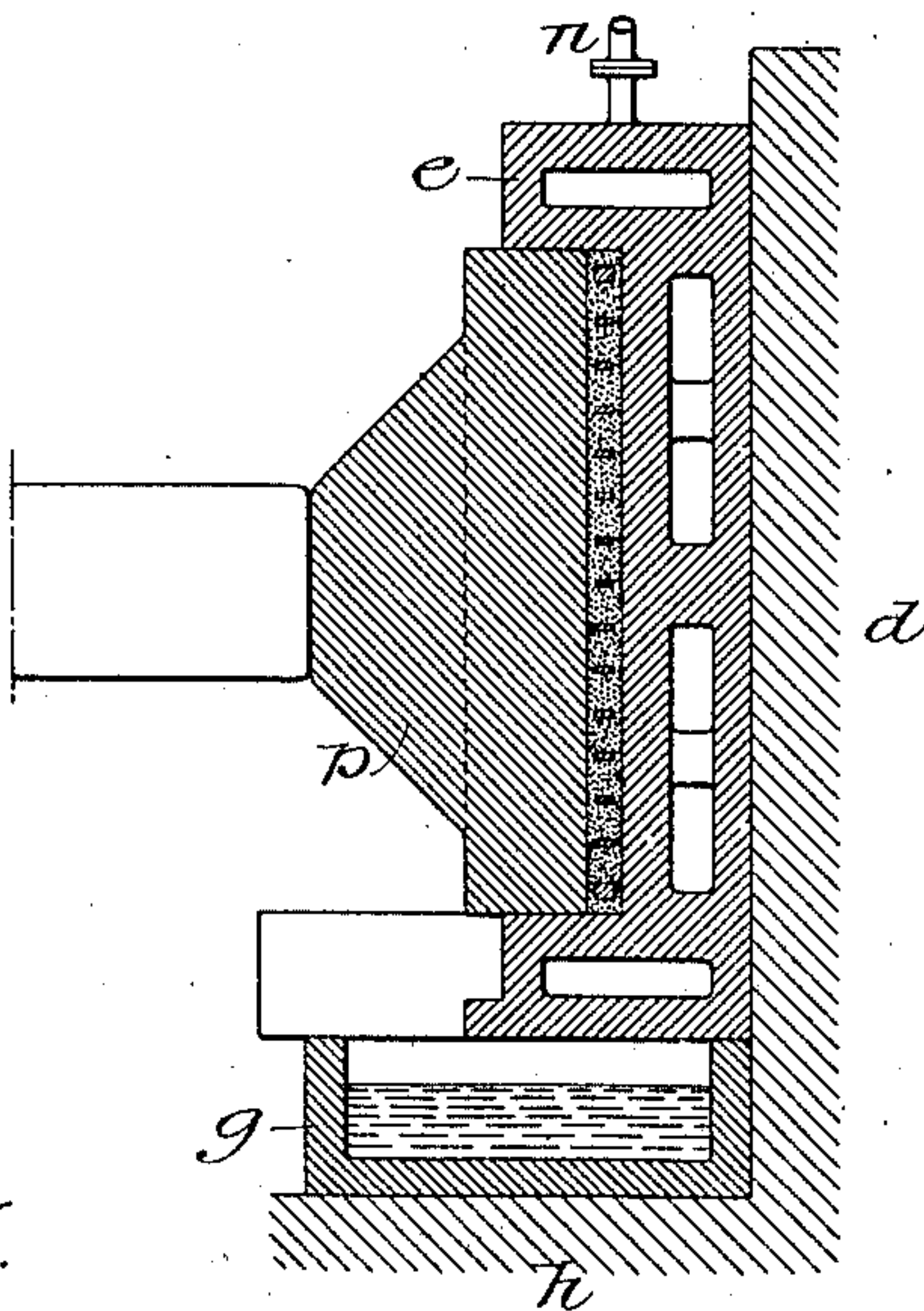
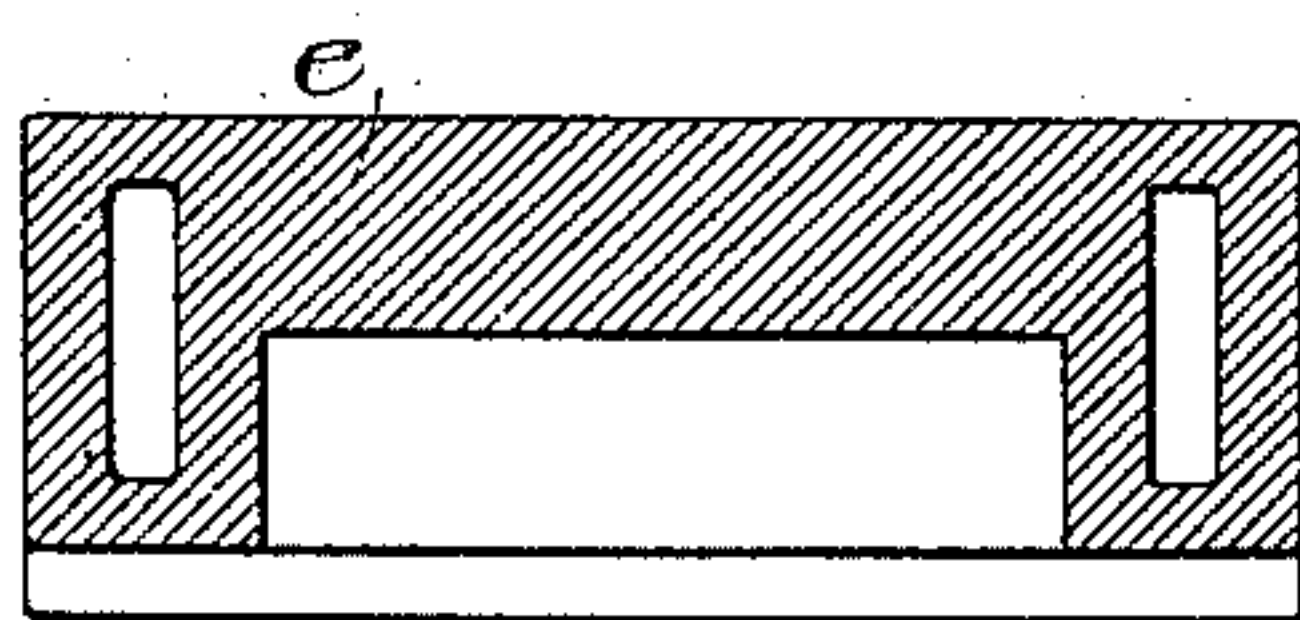


Fig. 3.



Witnesses:-

*Hamilton D. Turner*

*Louis H. F. Whitehead*

Inventors:-

*George T. Eyanson*

*Albert J. Shinn*

by their Attorneys:-

*Howell & Howland*



# UNITED STATES PATENT OFFICE.

GEORGE T. EYANSON AND ALBERT J. SHINN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNORS TO HERMAN J. DERCUM, TRUSTEE, OF SAME PLACE.

## PROCESS OF MANUFACTURING ZINC-AMALGAM PLATES.

SPECIFICATION forming part of Letters Patent No. 669,007, dated February 26, 1901.

Application filed June 11, 1900. Serial No. 19,875. (No specimens.)

*To all whom it may concern:*

Be it known that we, GEORGE T. EYANSON and ALBERT J. SHINN, citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain Improvements in Processes of Manufacturing Zinc-Amalgam Plates, of which the following is a specification.

Our invention relates to certain improvements in primary-battery plates and processes of manufacturing the same.

The object of our invention is to produce an improved plate for use in primary batteries, employing for this purpose a thick amalgam of zinc from which the surplus mercury has been taken and by pressure forming this amalgam into the desired shape, in which may be embodied a strengthening grid or support of a metallic or non-metallic nature, as fully described hereinafter.

Referring to the accompanying drawings, Figure 1 is a side view of a battery-plate formed by the process herein described, half of the thickness of the plate being removed to show the strengthening grid or support of sheet-zinc or other metallic or non-metallic material. Fig. 2 is a plan view of one form of mold in which the above battery-plate may be formed. Fig. 3 is a sectional view of the same; and Fig. 4 is a sectional view of one form of hydraulic press, showing a plate-mold in position.

In operating our improved process the zinc amalgam is freed from excess of mercury to the desired extent by centrifugal separation or other convenient method, and the resulting thick amalgam after being put into a mold, one form of which is shown in Figs. 2 and 3, is shaped into a plate of the required form by means of pressure. This pressure is preferably between fifty thousand and one hundred thousand pounds to the square inch. When large plates are to be formed, we propose to strengthen them by forming the amalgam around a gauze or grid, which is preferably of stamped sheet-zinc, placed with the amalgam in the mold and embodied in the plate, as clearly shown in Fig. 1 at *a*.

We preferably use a hydraulic press, the form of which is shown in Fig. 4. In this, *d* is the bed of the press, against which the plunger acts. This, with the mold, is preferably steam-jacketed in order that the amalgam may be heated to a certain degree while being pressed, and it is sometimes desirable to first heat the amalgam, particularly when plates are being formed rapidly. The steam connections are illustrated at *n* and *n'* and the mold is shown in place and also the plunger *p*, the whole being surrounded by a trough *g*, in which the mercury pressed out of the amalgam is collected and emptied into a suitable vessel. This trough may be a separate vessel or may be part of the base or plate on which the mold rests.

Metallic lugs (shown at *c* in Fig. 1) may be attached to and form part of the strengthening-grid pressed into and surrounded by the material of the battery-plate. These lugs may be used to support the plate in a battery-cell and also to act as the electrical terminals of the plate.

Our improved process is not intended to be confined to the manufacture of new plates, since it may be used to re-form partially-used or worn-out plates. The amalgamated surface of such plate is carefully washed and dried and being put into the mold with zinc amalgam is formed into a practically new plate.

It is obvious that instead of stamped sheet-zinc, forms of gauze, metallic or non-metallic, may be used to strengthen the plates. Also grids, support-plates, and other forms of metallic or non-metallic surfaces upon which it is possible to press the amalgam may be used to form the electrodes.

We claim as our invention—

1. The process herein described of making battery-plates, said process consisting in placing an amalgam of zinc with a supporting-grid in a mold and subjecting the same to pressure, and applying heat to said mold and to the amalgam during the operation.

2. The process herein described of manufacturing battery-plates, said process consisting in placing a piece of sheet-zinc between

two layers of zinc amalgam in a mold, and  
subjecting the same to hydraulic pressure,  
substantially as described.

3. The herein-described process of renew-  
5 ing zinc battery-plates, said process consist-  
ing in placing the plate to be renewed be-  
tween two layers of zinc amalgam in a mold  
and uniting the same in a homogeneous mass  
by pressure, substantially as described.

10 4. The herein-described process of manu-  
facturing battery-plates, said process consist-  
ing in subjecting an amalgam of zinc placed

in suitable molds to hydraulic pressure, said  
amalgam and molds being heated, substan-  
tially as described.

In testimony whereof we have signed our  
names to this specification in the presence of  
two subscribing witnesses.

GEO. T. EYANSON.  
ALBERT J. SHINN.

Witnesses:

WILLIAM E. BRADLEY,  
JOS. H. KLEIN.