

(No Model.)

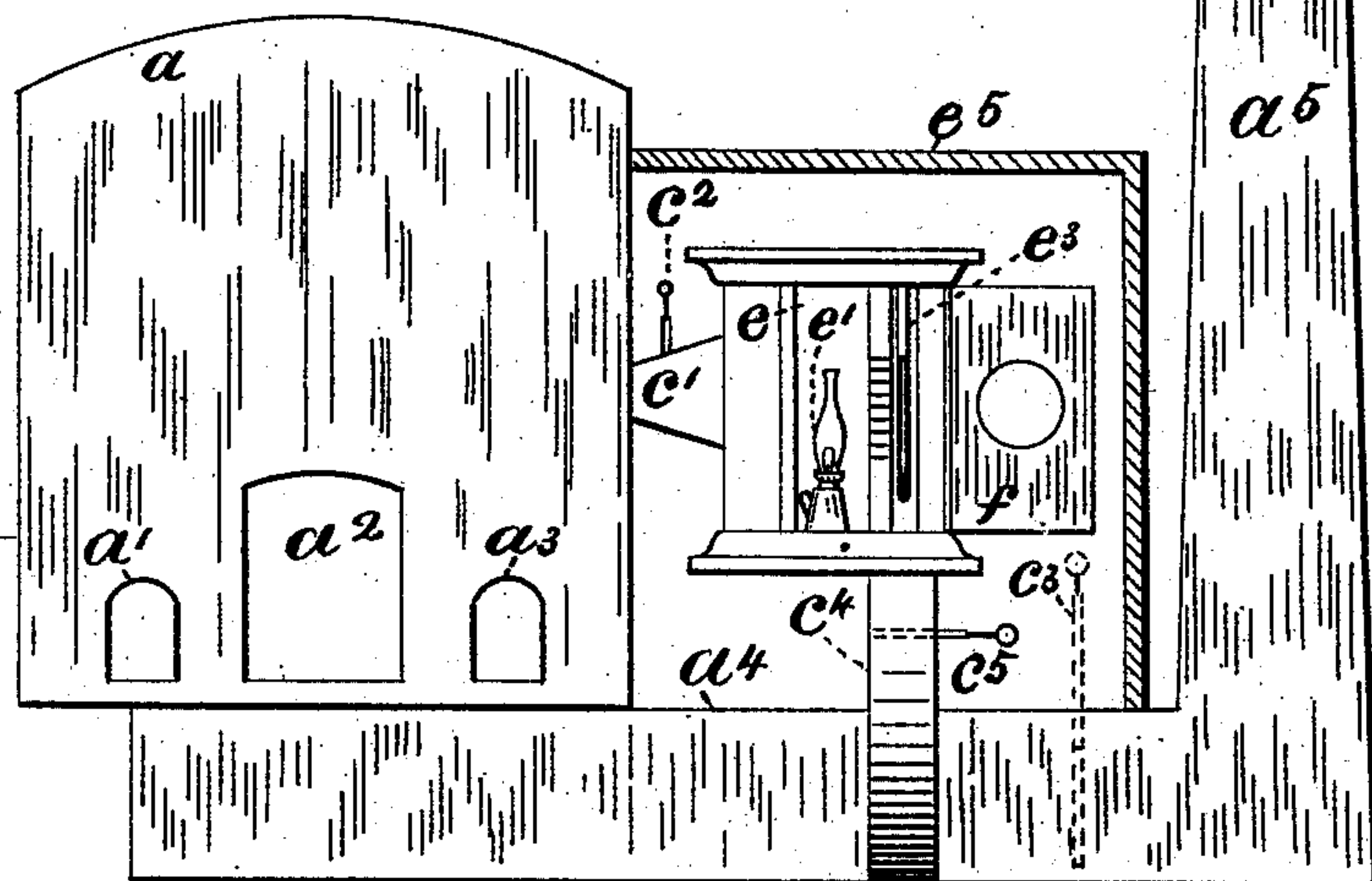
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# DEVICE FOR INDICATING THE TEMPERATURE IN ANNEALING FURNACES.

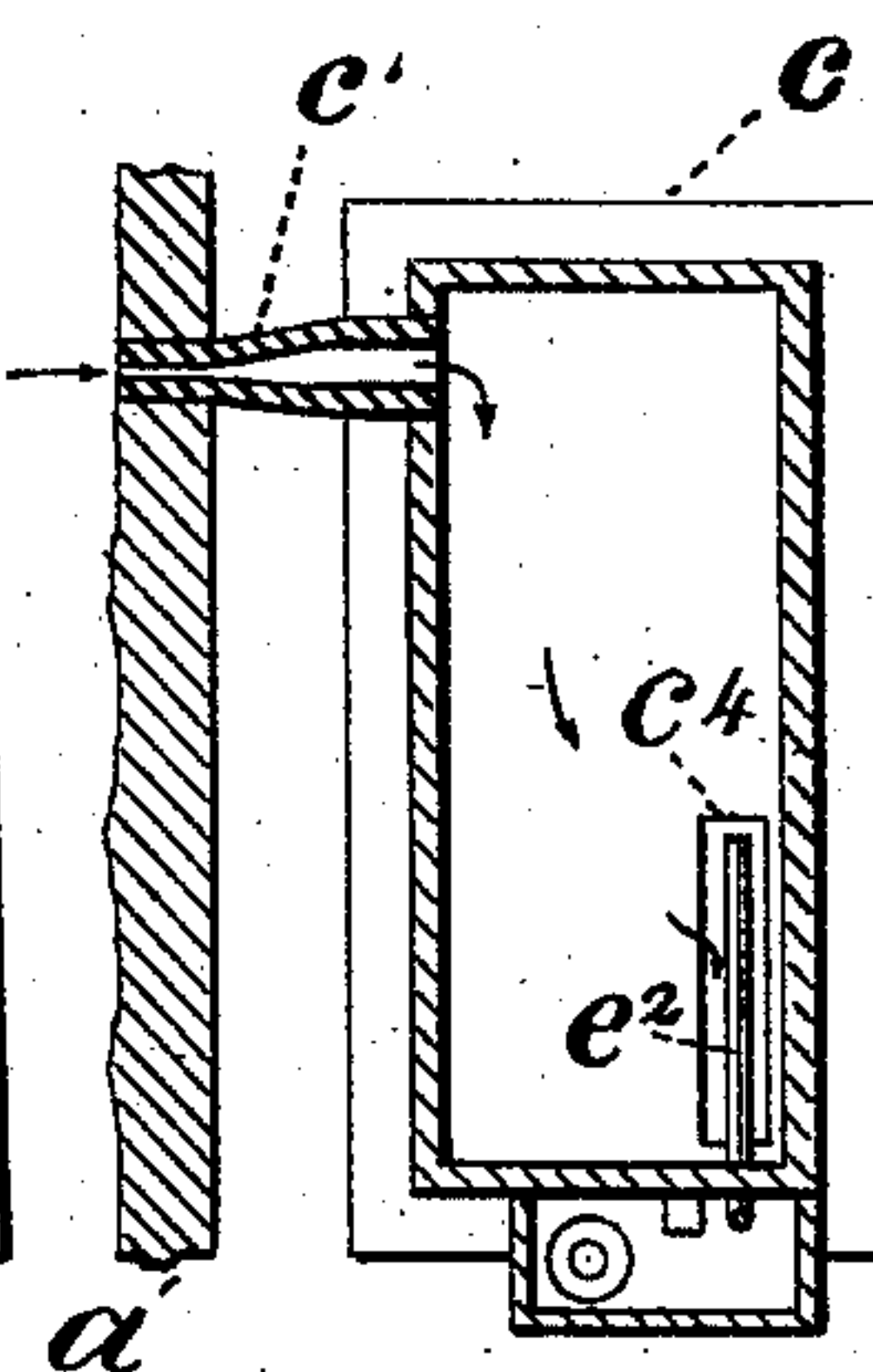
No. 292,497.

Patented Jan. 29, 1884.

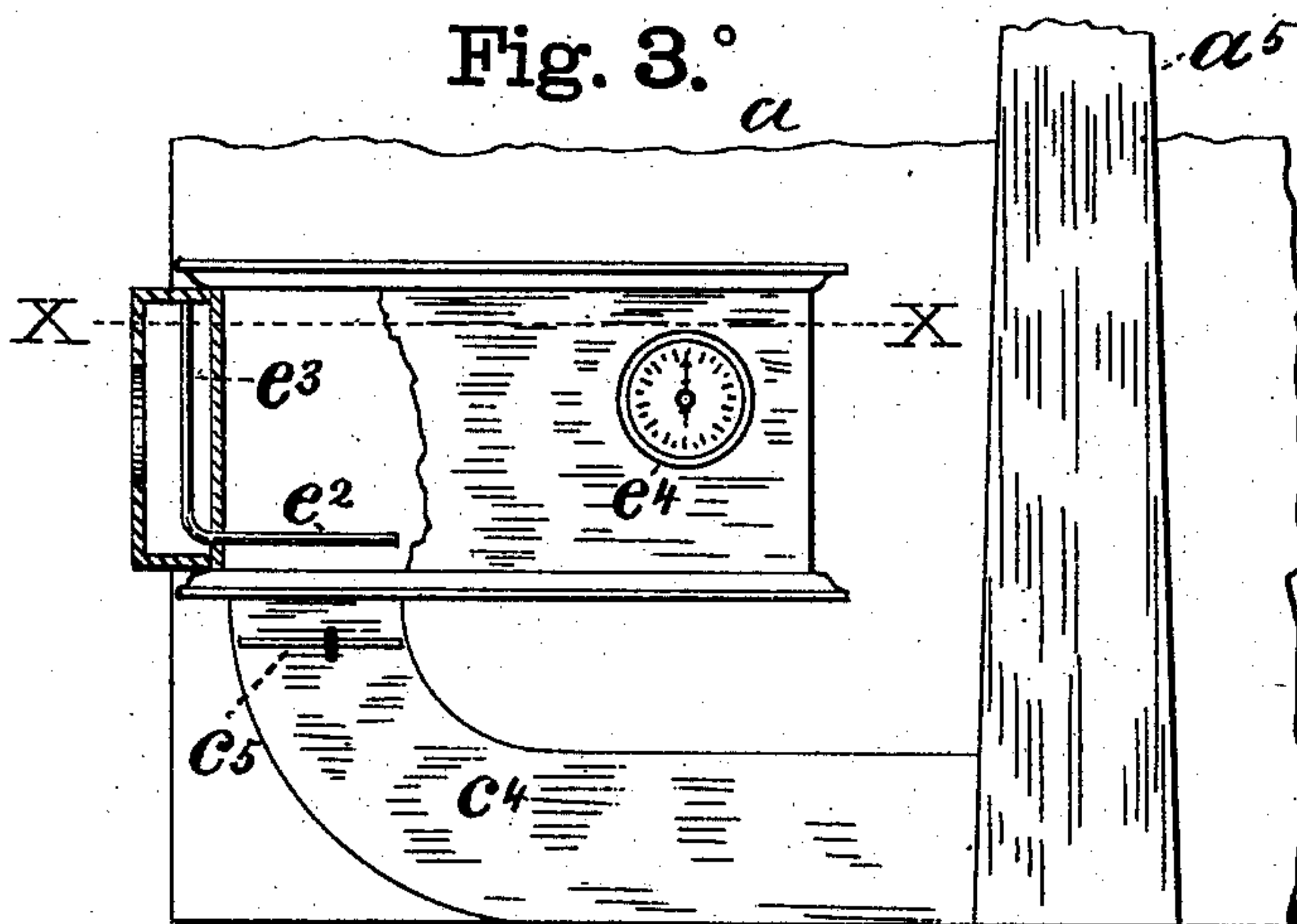
Fig. 1.



**Fig. 2.**



**Fig. 3.°**



Witnesses.

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# UNITED STATES PATENT OFFICE.

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DEVICE FOR INDICATING THE TEMPERATURE IN ANNEALING-FURNACES.

SPECIFICATION forming part of Letters Patent No. 292,497, dated January 29, 1884.

Application filed May 5, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, MICHEL A. LHUISSIER, a citizen of the Republic of France, having declared my intention to become a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Devices for Indicating the Temperature in Annealing-Furnaces, of which the following is a specification.

Malleable-iron or steel furnaces as heretofore constructed have not been provided with a suitable device for indicating the exact point when the proper degree of heat has been reached within the furnace; hence in large malleable-iron works it is not an unusual thing to have large batches of iron spoiled by overheating. The greatest obstacle in the way of an instrument of that kind has been the great degree of heat required within the furnace, so that a thermometer for indicating the temperature is soon destroyed by it.

The object of my invention is to obviate this objection, as will be fully and clearly hereinafter shown by reference to the accompanying drawings, in which—

Figure 1 is a front elevation of a malleable-iron or steel furnace, showing my device connected thereto, a small portion being in section. Fig. 2 is a horizontal section through the reducer and indicating device in line X X. Fig. 3 represents a portion of a furnace, showing a side elevation of my device connected thereto in partial section.

*a* represents an ordinary furnace, or portion of one, for annealing or preparing malleable iron or steel. It is made in the usual way, of brick or other suitable material.

*a'* *a''* *a'''* are the usual doors.

*a<sup>4</sup>* is the flue leading from openings in the floor or other suitable point to the chimney or smoke-stack *a<sup>5</sup>*; but as this part of the device is old and well known a further description here is unnecessary.

The reducer *c* may be of any convenient size or form, according to the size of the furnace to which it is applied. When connected to an ordinary-sized furnace, it may be a hollow device about three feet long by about eighteen inches square; but of course any other form or shape may be used. It is connected

to any suitable part of the furnace by a tube, *c'*, which is preferably made tapering, as shown in Figs. 1 and 2, and is provided with a damper or cut-off, *c<sup>2</sup>*. The main flue is also provided with a damper or cut-off, *c<sup>3</sup>*. (Shown in dotted lines, Fig. 1.) *c<sup>4</sup>* is a flue leading from the reducer to the main furnace-flue. It is also provided with a damper or sliding cut-off, *c<sup>5</sup>*. At one end or side of the reducer is a small space, *e*, for receiving a lamp, *e'*, and next to it is a space for a thermometer, *e<sup>2</sup>*, either a mercurial or other suitable thermometer. An instrument similar to the one shown answers the purpose very well. It consists of a glass tube, *e<sup>3</sup>*, having the usual index for indicating temperature, and the bent portion *e<sup>2</sup>*, passing into the reducer over the flue *c<sup>4</sup>*, to receive a portion of the heat passing through it into the flue *a<sup>4</sup>*. In some cases a metallic thermometer, *e<sup>4</sup>*, (see Fig. 3,) constructed in any well-known way, and provided with the usual graduated scale or index, may be used, if required. The reducer and its connections may be applied or attached to any convenient part of the furnace, and, if desired or necessary, it may be inclosed within a room, *e<sup>5</sup>*, (see Fig. 1,) so as to keep the temperature around it as nearly the same as possible, and in some cases it may be desirable to cover the outside with a coating of any well-known non-conducting material. *f* is a door for inclosing the thermometer and lamp. It is provided with a transparent space, *f'*, through which the thermometer may be seen.

The operation of the invention is as follows: The temperature being raised to the high point required, and all the dampers being opened, it will be seen that a small portion of the heated air passes out of the furnace through the tube *c'* into the reducer, through which the heated air passes in the direction of the arrows, through the reducer into the tube or flue *c<sup>4</sup>*, and in thus passing it loses a large portion of its temperature, so that there is not near as much heat in it when it passes the thermometer as there is within the furnace; but the scale or index may be raised so as to indicate the furnace temperature—that is, if the heat in the furnace is five times greater, for instance, than it is around the thermometer, the index or scale should be raised accordingly, so as to

indicate the temperature in the furnace. The damper  $c^2$  may be closed so as to adjust the amount of reduction of the temperature, and, if desired, it may be shut off altogether, and in some cases either of the dampers  $c^3$   $c^5$  may be closed, or partly closed, or opened, so as to regulate exactly the amount of heat passing through the several flues.

I claim as my invention—

- 10 1. The combination, with a furnace, of a reducer connected thereto by a tube, and to the main flue of the furnace by a flue,  $c^1$ , and a

thermometer, substantially as and for the purposes described.

2. The reducer  $c$ , connected to the furnace 15 by a tube,  $c'$ , provided with a damper or valve,  $c^2$ , in combination with a thermometer and an outlet-tube,  $c^1$ , connected with the furnace outlet-flue  $a^1$ , the flue  $a^1$  having a damper or valve,  $c^3$ , as and for the purposes described.

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Witnesses:

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