E. E. F. CREIGHTON.

ANNEALING FURNACE.

APPLICATION FILED FEB. 7, 1906.

901,956.

Patented Oct. 27, 1908.

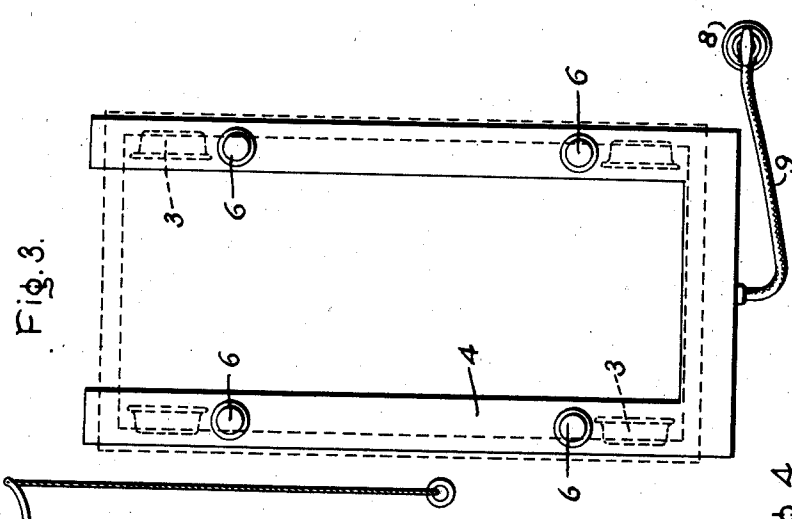


Fig. 3.

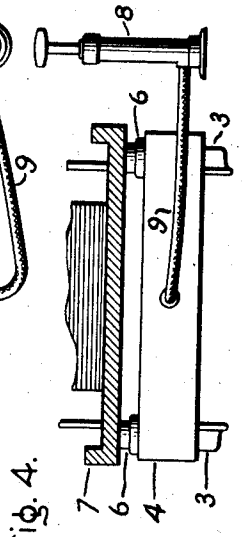


Fig. 4.

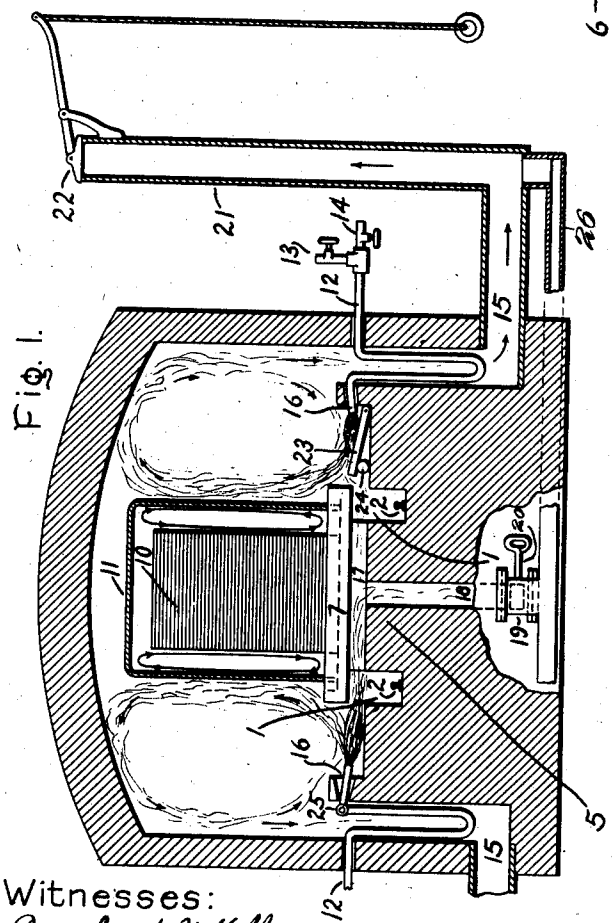


Fig. 1.

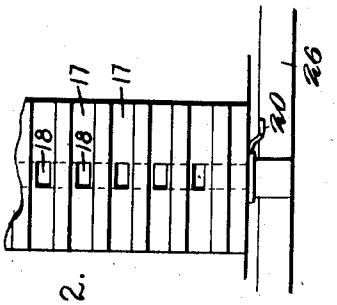


Fig. 2.

Witnesses:

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UNITED STATES PATENT OFFICE.

ELMER E. F. CREIGHTON, OF SCHENECTADY, NEW YORK, ASSIGNOR TO STANLEY G. I. ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

ANNEALING-FURNACE.

No. 901,956. Specification of Letters Patent. Patented Oct. 27, 1908.

Application filed February 7, 1906. Serial No. 299,940.

To all whom it may concern:

Be it known that I, ELMER E. F. CREIGHTON, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Annealing-Furnaces, of which the following is a specification.

This invention relates to furnaces for annealing iron, and especially large quantities of laminations of iron such as are used in building up transformer cores. It is a matter of some difficulty to secure a uniform annealing of a pile of such laminations, owing to the uneven distribution of the heat in the furnace. My invention aims to produce such a circulation of the hot gases as to effect a practically uniform heating of the iron.

The invention is shown in a somewhat diagrammatic manner in the accompanying drawing, in which

Figure 1 is a vertical cross section of a furnace built in accordance with my ideas; Fig. 2 is a top plan view of a portion of the supporting platform; Fig. 3 is a top plan view of the truck or car on a larger scale; and Fig. 4 is an end view of the same.

In the bottom of the furnace are two parallel grooves or troughs 1, in which are laid rails 2 to support and guide the wheels 3 of a truck or car 4, which is U-shaped in plan view in order to straddle the platform or support 5 which rises from the floor of the furnace between the rails. The truck is provided with four or more jacks 6, preferably hydraulic, on which the bed or tray 7 is supported and by means of which it can be raised and lowered. The jacks can be operated by a hand or other pump 8 connected with them by a flexible hose 9.

The sheets of iron to be annealed are assembled in a pile 10 on the bed, and are then covered with a sheet-iron box or hood 11, which leaves a space surrounding the pile of iron. The truck is then run into the furnace and the jacks are lowered until the bed rests on the platform. The jacks are then run down and the truck backed out, leaving the bed and its load in the furnace, as shown in Fig. 1.

A pipe 12 enters each side of the furnace, and air and gas are supplied to it through the pipes 13 and 14 respectively. The pipe 12 is coiled in the exhaust flue 15 of the furnace and then terminates in a nozzle 16 aimed toward the bottom of the oven, which is preferably somewhat lower than the platform 5. Transverse channels 17 are formed across the platform, and from each channel a down-flue 18 leads to an exhaust flue 19, controlled by a damper 20, or otherwise. The exhaust flues 15 lead to stacks 21, which can be provided with dampers 22 while auxiliary exhaust flues 26 connect flue 19 with the stacks 21.

In order to properly direct the inflowing jet of flame from the nozzle, the furnace may have a false bottom 23, vertically and angularly adjustable in any suitable manner, as by means of a prop 24 placed under its inner end. Or, if preferred, the nozzle may be hinged, as shown at 25, so that it can be turned to the proper angle to deliver the flame where it will be most effective.

The flame and hot gases first strike the lower part of the box and rise along its sides to the top of the furnace, where they turn outwardly and flow down the walls of the furnace to the flues 15. A portion of the flame and hot gases passes under the bed and out through the flue 19, the amount depending on the position of the damper 20. Inside the box, the air at the bottom is heated the hottest by the flame impinging on the outside of the box at that point, and circulates up the sides of the box and down along the sides of the pile of iron, as clearly shown by the lines and arrows.

With a furnace using a side-flame there is a tendency to overheat the material at the top of the pile, while with a jet of flame playing on the bottom of the pile the iron there will be overheated. With my arrangement the temperature at all points of the pile may easily be made and kept uniform.

What I claim as new, and desire to secure by Letters Patent of the United States, is,—

1. In an annealing furnace the combination with a heating chamber, of a support mounted in said chamber to carry the material to be annealed, said support having passages opening into said chamber at the sides of said support, and heaters mounted to direct part of the heated gases against the sides of said support and part of said gases into the open ends of said passages.

2. In an annealing furnace the combination with a heating chamber, of a support mounted in said chamber to carry the mate-

rial to be annealed and having passages opening into said chamber, heaters mounted to direct heated gases against said support and into the passages, an exhaust flue for said chamber, and an independent exhaust flue connected to said passages.

3. In an annealing furnace the combination with a heating chamber, of a support mounted in said chamber to carry the material to be annealed and having passages opening into said chamber, heaters mounted to direct heated gases against said support and into said passages, independent exhaust flues connected to said chamber and to said passages, and a damper mounted in one of said flues to control the flow of gases through it.

4. In an annealing furnace, the combination with a heating chamber, of heaters for directing heated gases away from the walls and toward the bottom of the chamber, and exhaust flues opening into the chamber near the lower edge of the walls thereof.

5. In an annealing furnace, the combination with a heating chamber, of heaters for directing heated gases away from the walls and toward the bottom of the chamber, adjustable means for controlling the direction of flow of the gases, and exhaust flues opening into the chamber near the lower edge of the walls thereof.

6. In an annealing furnace, the combination with a heating chamber, of a support having open-ended passages therein mounted near the bottom of said chamber to carry the material to be annealed, exhaust flues communicating with the passages, exhaust flues opening into the chamber near the lower edge of the walls thereof, and heaters in said chamber for directing heated gases away from the walls over said support and into said passages.

7. In an annealing furnace, the combination with a heating chamber, of a support having open-ended passages therein mounted near the bottom of said chamber to carry the material to be annealed, exhaust flues communicating with the passages, exhaust flues opening into the chamber near the lower edge of the walls thereof, heaters for directing heated gases over said support and into said passages, and dampers controlling said exhaust flues.

8. In an annealing furnace the combination with a heating chamber, of a flat support mounted near the bottom of said chamber, a removable bed carried by said support, a removable cover arranged to coöperate with said bed to form a closed annealing chamber, said support having passages therein opening into said heating chamber at the edge of the support, and heaters mounted to direct heated gases against the edge of said support and into said passages.

9. In an annealing furnace the combination with a heating chamber, of a support having open-ended passages therein mounted near the bottom of said chamber, a removable cover arranged to coöperate with said support to form a closed annealing chamber, heaters mounted to direct heated gases against the lower edge of said annealing chamber and into said passages, an exhaust flue communicating with said passages, and an exhaust flue opening into said heating chamber near the lower edge of the walls thereof.

In witness whereof I have hereunto set my hand this 6th day of February, 1906.

ELMER E. F. CREIGHTON.

Witnesses:

BENJAMIN B. HULL,

HELEN ORFORD.