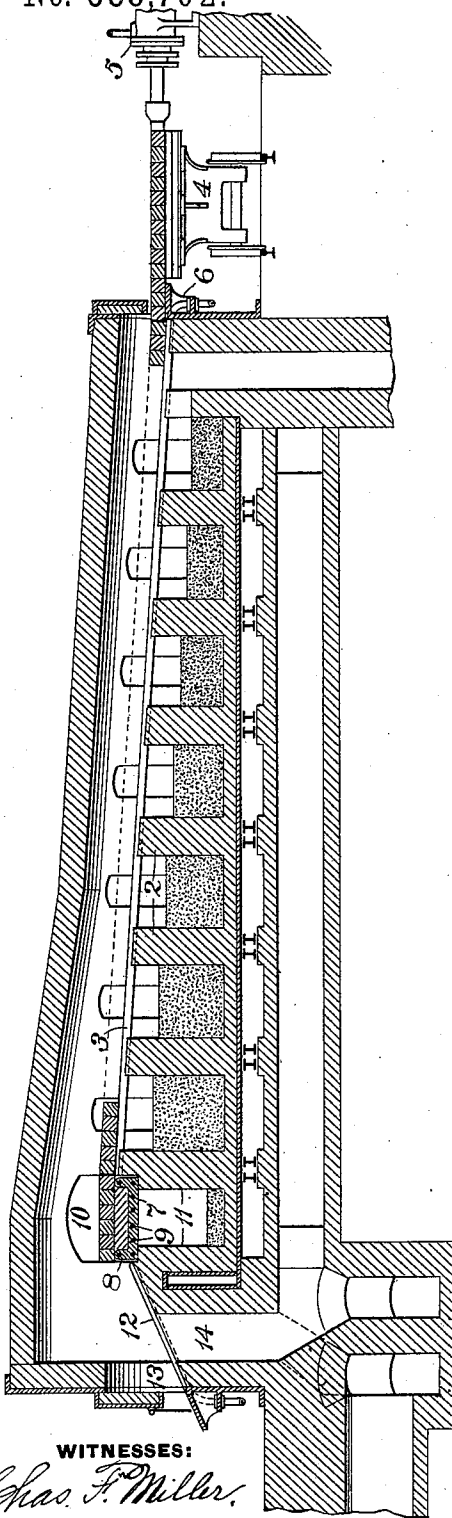


A. LAUGHLIN & J. REULEAUX. HEATING FURNACE.

No. 588,702.

Patented Aug. 24, 1897.

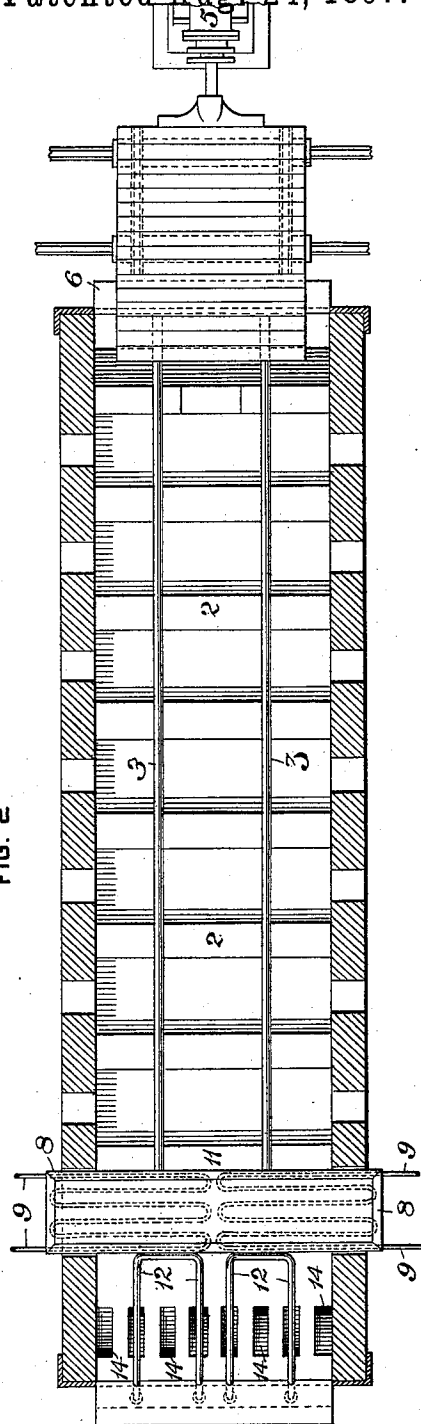
FIG. 1.



WITNESSES:

Chas. F. Miller.
A. E. Gaither

FIG. 2.



INVENTORS,

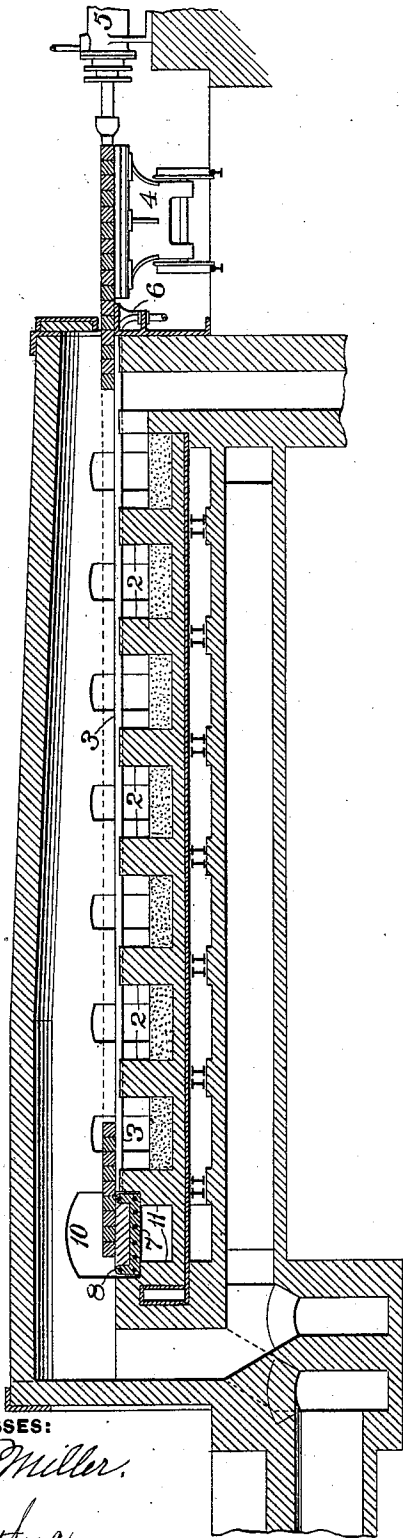
Alexander Laughlin
Josef Reuleaux
by Saml. S. Wolcott Att'y.

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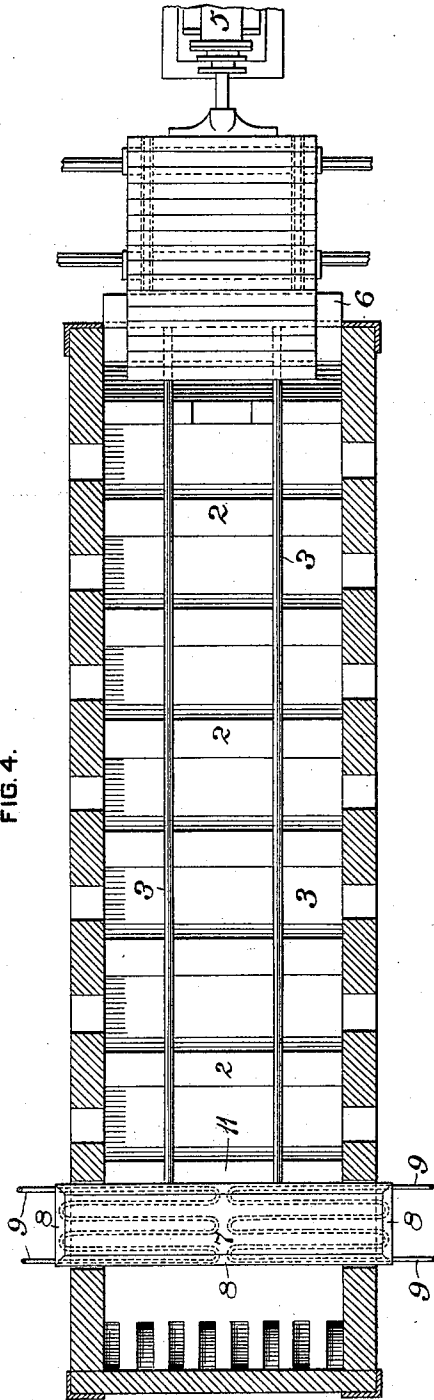
FIG. 3.



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FIG. 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER LAUGHLIN, OF SEWICKLEY, AND JOSEF REULEAUX, OF WILKINSBURG, PENNSYLVANIA; SAID REULEAUX ASSIGNOR TO SAID LAUGHLIN.

HEATING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 588,702, dated August 24, 1897.

Application filed April 30, 1897. Serial No. 634,570. (No model.)

To all whom it may concern:

Be it known that we, ALEXANDER LAUGHLIN, residing at Sewickley, and JOSEF REULEAUX, residing at Wilkesburg, in the county of Allegheny and State of Pennsylvania, citizens of the United States, have invented or discovered certain new and useful Improvements in Heating-Furnaces, of which improvements the following is a specification.

Considerable difficulty is experienced in the heating of billets in continuous furnaces in obtaining a uniform heat throughout all portions of the billets. This difficulty arises from the fact that the billets are supported during their passage through the furnace by pipes or tubes which are cooled by water, so that the portions of the billet in contact therewith will not be highly heated, their temperature being lower than the temperature of the rest of the billet. Where the billets are discharged from these pipes or tubes onto hearths and allowed to remain there for a short time, these black or chilled spots will disappear, the hearth being located at the hottest portion of the furnace. While the use of a hearth as a temporary resting-place for the billets prior to their removal to the furnace is effective as regards removal of the black spots, yet the movement of the billets onto and off from the hearth rapidly destroys the same, as the material forming the hearth is softened by the great heat to which it is subjected.

The object of the present invention is to provide a hearth whereon the billets can be heated to a uniform temperature throughout, and to protect such hearth as against excessive heating and consequent softening to such a condition that it will be quickly injured or destroyed by the billets passing over it.

It is a further object of the invention to so construct the hearth that it can be readily renewed or repaired.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a sectional elevation, and Fig. 2 a sectional plan view, of a preferred form of furnace having our improved hearth applied thereto. Figs. 3 and 4 are similar views showing the application of our improvements to the ordinary

form or construction of continuous heating-furnace, from which the billets are drawn through a door located in the side of the furnace.

In the practice of our invention the form of furnace shown in Figs. 1 and 2 is constructed in the manner described and shown in application Serial No. 615,740, filed December 15, 1896; and it consists of a long furnace or heating-chamber provided with a series of transverse walls 2, which serve as supports for the hollow tubes or rails 3, along which the billets are pushed by suitable mechanism. These rails or tubes 3 are connected by pipes to a suitable source of supply for the circulation of water therethrough. The billets are placed upon a truck 4, which is then run in front of the furnace and pushed by the ram 5 off of the truck onto the fore-plate 6, and thence onto the rails and through the furnace. The rails 3 extend to a point adjacent to the front end of the furnace, so as to permit of the billets being forced from the rails directly onto the hearth. This hearth consists of a metal plate or tray 7, preferably provided with upwardly-projecting sides 8, so as to retain the sand, fire-clay, or other material forming the receiving-bed of the hearth. Provision is made for preventing an excessive heating of the plate or tray 7 by the circulation of water therethrough. A suitable means for effecting such circulation and consequent cooling consists in the formation of a series of connected passages formed in the body of the tray or plate, said passages being connected by pipes 9 with a suitable source of water-supply.

As shown in Figs. 1 and 2, the plate or tray may be made of such a length as to project through openings 10 in the side walls of the furnace and is removably supported upon piers or transverse walls 11, as shown in Fig. 1.

As will be readily understood by those skilled in the art, the comparatively cool plate or tray will prevent the sand or other material forming the bed of the hearth from being heated to such an extent as will render it soft and easily injured by the movement of the billets across it, but will not prevent the surface of such filling material from attaining such a temperature as will insure the heating

of the chilled or black spots to the required temperature while the billets are resting upon the hearth.

In the construction shown in Figs. 1 and 2 provision is made for the discharge of the billets through the end wall of the furnace, as described in the application heretofore referred to, such means consisting, generally stated, in rails or bridge-pieces 12, extending down at an angle from the hearth to the discharge-opening 13 in the end of the furnace. These bridge-pieces are inclined at such an angle that when the billets are pushed off of the hearth they will slide quickly down the inclines over the gas and air flues 14 and through the discharge-opening 13.

As shown in Figs. 3 and 4, our improved form of hearth can be applied to furnaces in which the billets are removed through openings in the sides of the furnace.

As shown in Figs. 3 and 4, the side openings 10 may be used as discharge-openings for the removal of the heated billets by tongs or other suitable mechanism, in which case the bridge-pieces 12 are omitted and the rear end of the furnace is made solid or without any opening.

The improvements herein described are readily applicable to forms or constructions of heating-furnace other than those shown, nor is it our intention to limit the invention herein to any particular form or construction of tray or bed for supporting the filling material nor to the particular means shown and described for preventing an excessive heating of the

tray, as other means will readily suggest themselves to those skilled in the art for effecting these purposes.

We claim herein as our invention—

1. A furnace having in combination therewith rails or supports arranged longitudinally of the furnace, hearth-supports arranged transversely of the furnace at the inner ends of the rails or supports, a hearth consisting of a plate or tray and a refractory filling material and movable on said supports into and out of the furnace, means for pushing billets along the rails and onto the hearth, and inlet and outlet flues arranged respectively at opposite ends of the furnace, substantially as set forth.

2. A furnace having feed and discharge openings at its ends in combination with rails or supports arranged longitudinally of the furnace, a removable hearth arranged at the inner ends of the rails or supports inclined bridge-pieces extending from the hearth to the discharge-opening and means for pushing the articles to be heated along the rails onto and over the hearth and inlet and outlet flues arranged respectively at opposite ends of the furnace, substantially as set forth.

In testimony whereof we have hereunto set our hands.

ALEXANDER LAUGHLIN.
JOSEF REULEAUX.

Witnesses:

DARWIN S. WOLCOTT,
F. E. GAITHER.