

L. C. STEELE.  
HEATING FURNACE FOR SHEET METAL.  
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964,191.

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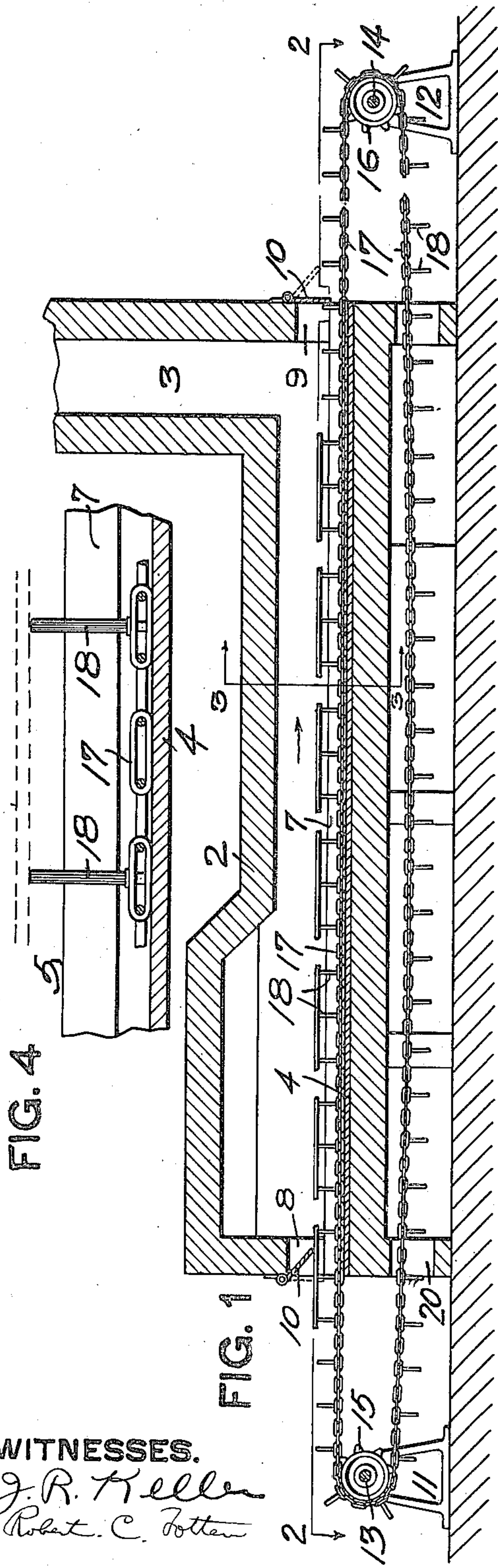


FIG. 4

FIG. 2

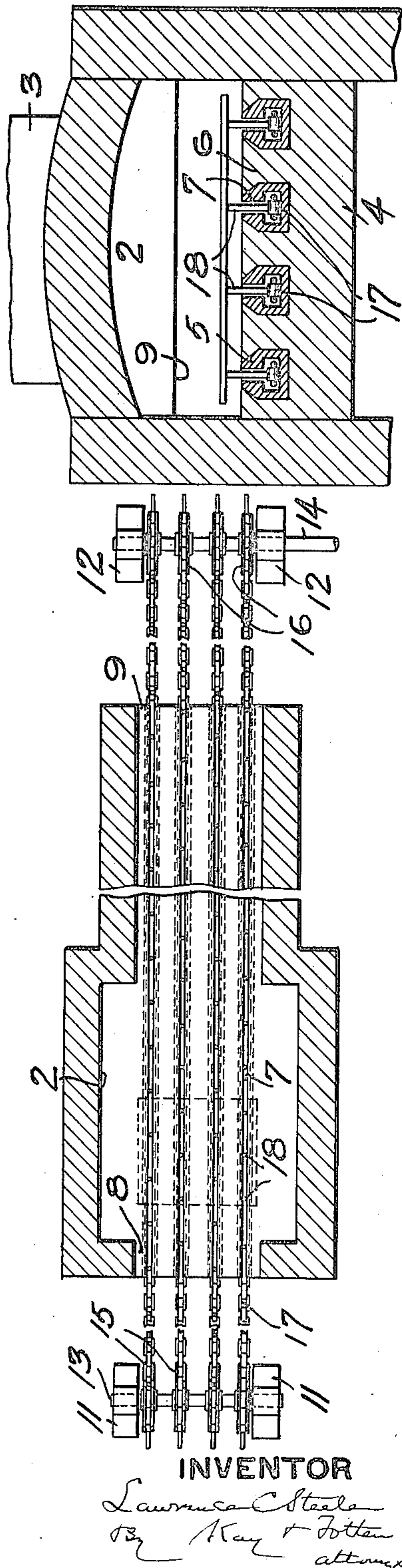


FIG. 3

WITNESSES.  
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# UNITED STATES PATENT OFFICE.

LAWRENCE C. STEELE, OF PITTSBURG, PENNSYLVANIA.

HEATING-FURNACE FOR SHEET METAL.

964,191.

Specification of Letters Patent.

Patented July 12, 1910.

Application filed May 15, 1909. Serial No. 496,313.

*To all whom it may concern:*

Be it known that I, LAWRENCE C. STEELE, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Heating-Furnaces for Sheet Metal; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to heating furnaces, and more especially to furnaces adapted for the heating of packs in the manufacture of sheet-metal, the object of the invention being to provide a furnace of this character in which the packs are so supported as to give the heat an opportunity to heat the pack evenly throughout and prevent the streaking of the packs, which interferes with the rolling and the production of a uniform product, and at the same time provide a continuous furnace of this character in which the packs are inserted at one end and withdrawn from the other.

To these ends my invention comprises the novel features hereinafter set forth and claimed.

In the drawings Figure 1 is a longitudinal sectional view of my improved furnace; Fig. 2 is a sectional view on the line 2-2, Fig. 1; Fig. 3 is a cross section on the line 3-3, Fig. 1; and Fig. 4 is an enlarged detail of the chain carrier.

Referring to the drawings the numeral 2 designates the furnace which may be of any suitable construction and heated by gas or other fuel, said furnace being provided with proper flues and the stack 3. The bottom 4 of the furnace is built up of brick-work and contained within said bottom are the guide-ways 5 which are made up of the tile or bricks 6 of special construction set in the brick work of the bottom so as to be flush with the top thereof or the hearth of the furnace. These special bricks 6 have the slots 7 formed therein which, when the tile are laid in the manner indicated, will form continuous slots in the hearth thereof extending from one end of the furnace to the other. Instead of tile or brick 6 metal of suitable character might be employed.

The furnace is provided with the openings forming the inlet 8 and the outlet 9 provided with swinging doors 10.

Located at the front and rear of the furnace are the standards 11 and 12, which form supports for the shafts 13 and 14 which have mounted thereon the sprocket-wheels 15 and

16 respectively. The shaft 14 is the drive-shaft and may be connected up to any suitable source of power. The endless chains 17 engage the sprocket-wheels 15 and 16, and said chains may be of any suitable construction, the links of which are provided at intervals with the pins or fingers 18, these chains 17 being adapted to travel in the passages or guide-ways 5 in the furnace bottom with the fingers 18 projecting up through the slots 7. The chains are thus protected from the intense heat of the furnace and as the air circulates through the passages 5 said chains are kept cool and there is practically no wear or tear on the same due to the action of the heat. Only the upper portions of the fingers 18 project into the furnace and are subjected to the furnace heat. These fingers 18 are removably secured to the chain links so that they may be readily renewed in case they burn out. The chains 17 pass beneath the furnace hearth, openings 20 being provided for this purpose.

The standards 11 and 12 are so located with reference to the front and rear walls of the furnace to give sufficient room for the depositing of the sheets upon the carrier before they enter the furnace at the front end, while at the rear end the sheets are supported after they emerge from the furnace and before they are lifted therefrom.

When the packs are to be heated they are placed upon the fingers 18 as clearly indicated and with the chain traveling in the direction of the arrow the packs are carried into the furnace-chamber, the door 10 swinging inwardly and moving over the top of the pack. The said door will only open sufficiently to allow for the entrance of the packs and thus acts to prevent the undue entrance of cold air. The pack being supported upon the fingers at isolated points and raised from the furnace hearth a suitable distance, is subjected to the action of the heat on all sides and at all points on its area except the points on the bottom of the packs covered by the area of the fingers 18. This, however, is so inappreciable that it does not interfere with the equal heating of the pack and the cooling effect of the contact with the fingers is not sufficient to streak or cool the plates sufficiently at such points as to interfere with their proper working after they leave the furnace. The chain travels through the furnace at a regulated rate of speed so that when the pack



reaches the outlet it will have been properly heated and the door 9 will swing outwardly when the pack comes in contact with it, and will move over the top of the pack in the same manner as the entrance door. As the pack emerges from the furnace it is still supported by the carrier until it has entirely left the furnace when it may readily be removed and carried to the rolls without further rolling.

My improved furnace will be found particularly advantageous for use in connection with a mill for the continuous rolling of sheet metal as the packs enter at one end and pass out the opposite end in a continuous manner. My invention will also be found to be applicable for what is known as "open annealing," that is, where the sheet metal instead of being inclosed in air-tight boxes is simply passed through the heating chamber and annealed in this way. The packs can be fed continuously into the furnace and the travel of the carrier regulated so as to give the packs the proper time within the furnace to become properly annealed. By the use of a continuous furnace of this character a great deal of time and labor is saved as the packs are delivered into the furnace at one end and removed from the opposite end so that the operation is a continuous one and the time heretofore re-

quired in the old style of furnaces for charging and withdrawing the packs from the same end is done away with. The chain is thoroughly protected against the action of the heat and as the fingers are readily renewable the cost of maintenance is very low.

What I claim is:

1. In a heating furnace, the combination of the heating chamber having guide-ways formed in the hearth thereof, carriers traveling in said guide-ways, slots communicating with said guideways, fingers on said carriers passing through said slots, and means for moving said carriers through said guide-ways.

2. In heating furnaces, the combination of the heating chamber having T-shaped guideways formed in the hearth thereof, endless chains traveling in the enlarged portions of said guideways, fingers on said chains passing through the vertical portions of said T-shaped guideways and extending beyond the same, and means for moving said chains through said guideways.

In testimony whereof, I, the said LAWRENCE C. STEELE, have hereunto set my hand.

LAWRENCE C. STEELE.

Witnesses:

ROBERT C. TOTTEN,  
JOHN F. WILL.