

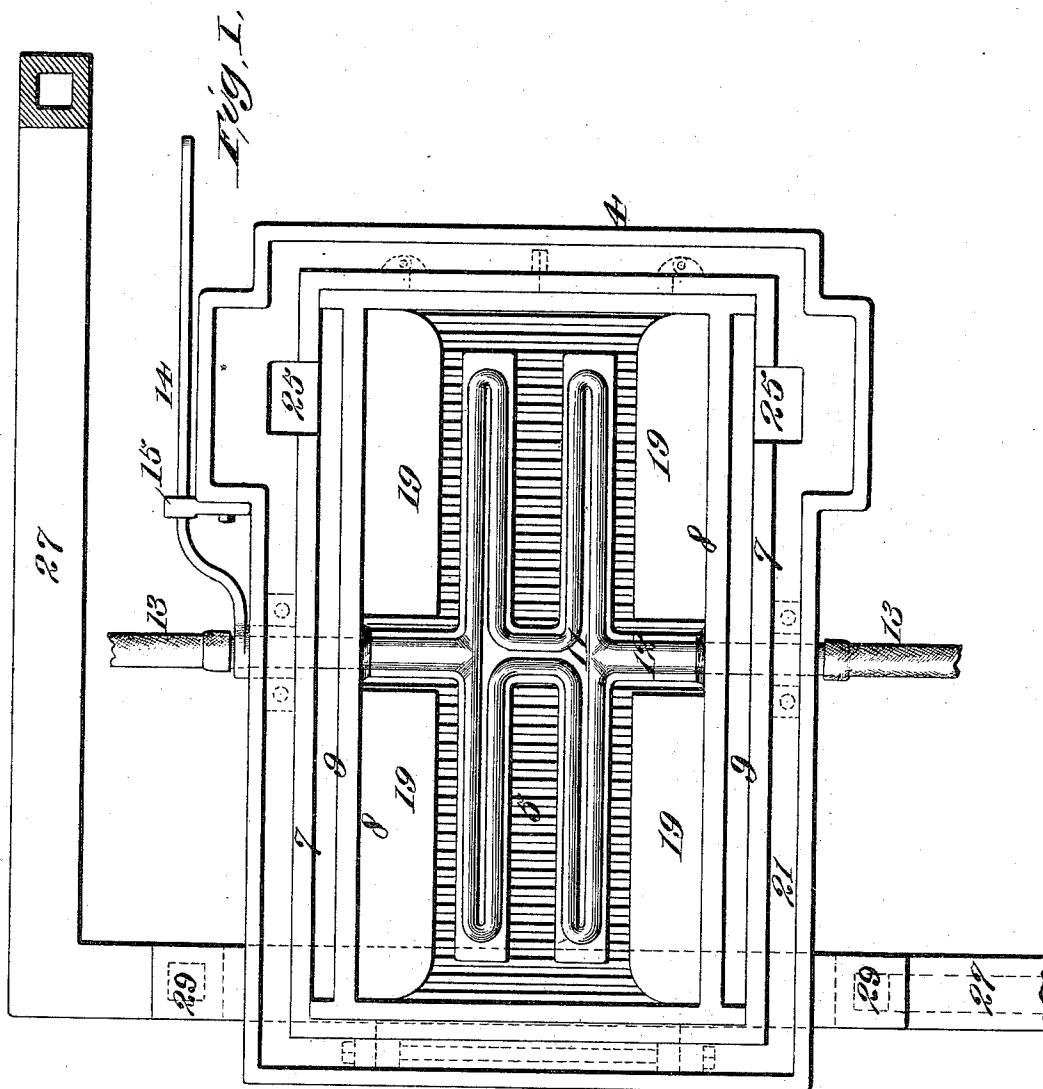
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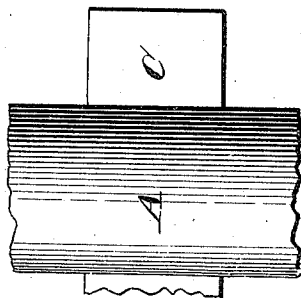
W. E. HARRIS.
SHEET IRON HEATING FURNACE.

No. 537,387.

Patented Apr. 9, 1895.



Witness
Chas. G. Edwards
E. S. Knight



Inventor:
William E. Harris
By Knight Bros.
Attys

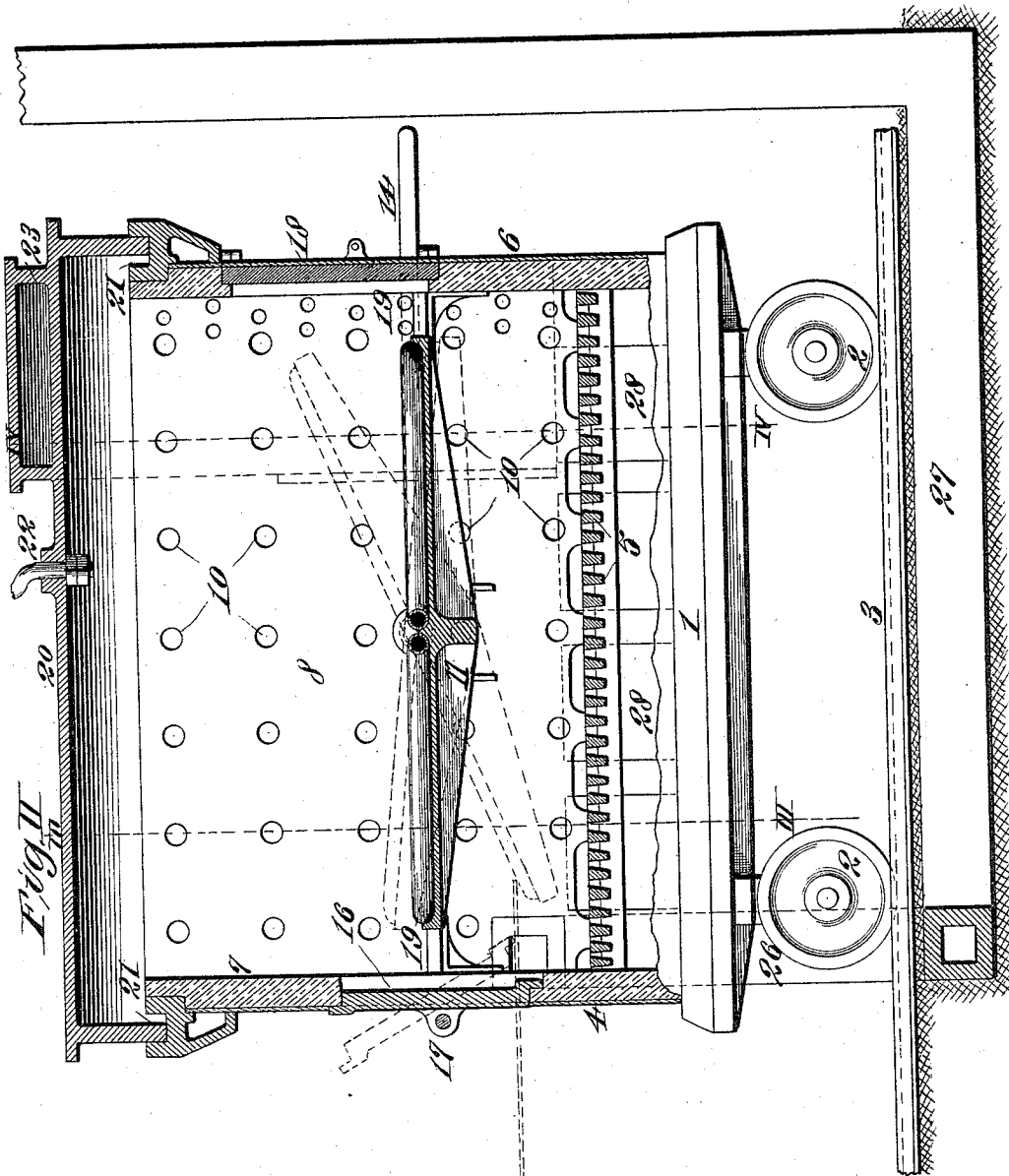
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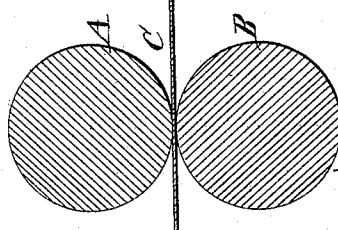
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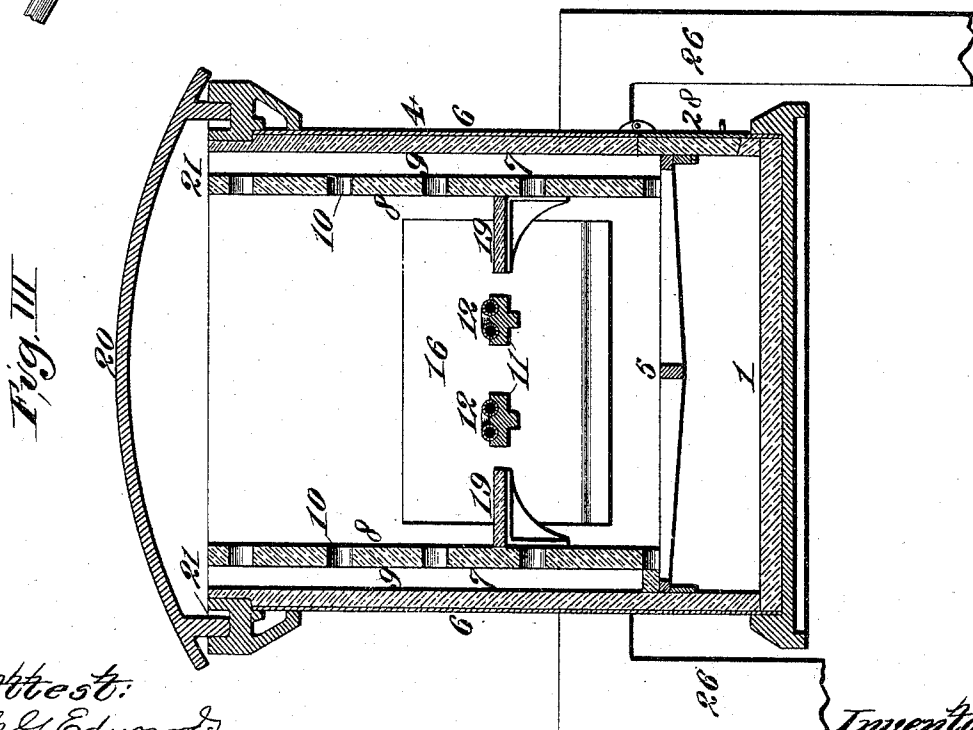
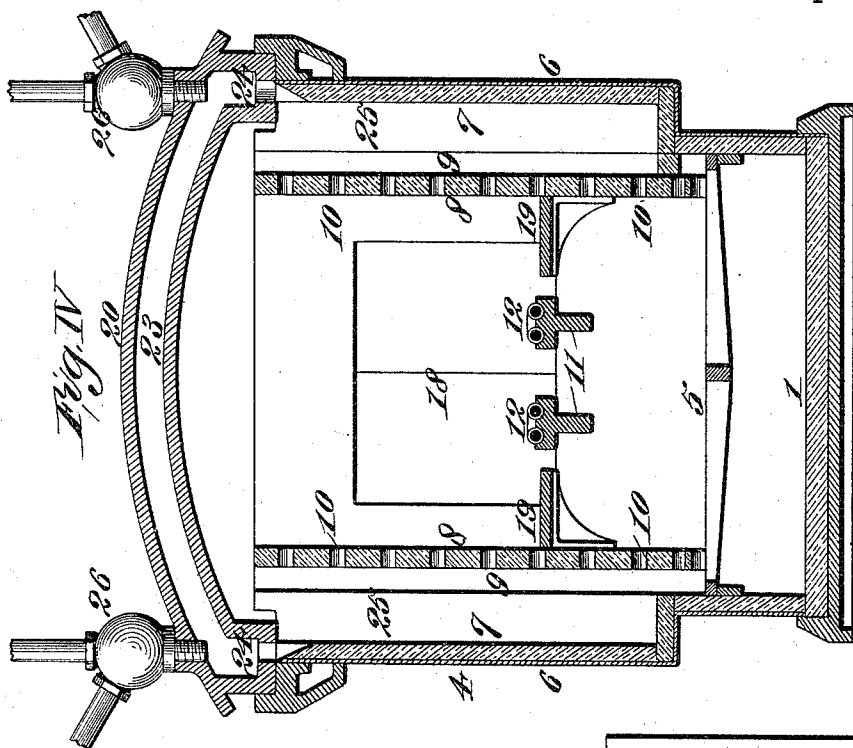
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3 Sheets—Sheet 3.

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No. 537,387.

Patented Apr. 9, 1895.



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UNITED STATES PATENT OFFICE.

WILLIAM E. HARRIS, OF NILES, OHIO.

SHEET-IRON-HEATING FURNACE.

SPECIFICATION forming part of Letters Patent No. 537,387, dated April 9, 1895.

Application filed August 13, 1894. Serial No. 520,197. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. HARRIS, of Niles, in the county of Trumbull, in the State of Ohio, have invented a certain new and useful Improvement in Sheet-Iron-Heating Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a heating furnace, designed to be employed in keeping sheet iron in a nearly uniform heated condition during the process of rolling, whereby I avoid the usual constant cooling and reheating incident in the ordinary practice of rolling, which constant cooling and reheating is very detrimental to the quality of the sheet iron, and results in a very considerable loss in time and labor in the work; and my invention consists in features of novelty hereinafter fully described and pointed out in the claims.

Figure I is a top view of the furnace with the cover removed. Fig. II is a vertical, longitudinal section through the central portion of the furnace. Fig. III is a vertical, transverse section taken on line III—III, Fig. II. Fig. IV is a vertical, transverse section taken on line IV—IV, Fig. II.

Referring to the drawings, 1 represents the base of the furnace, provided with wheels 2, that travel upon a track 3.

4 represents the body of the furnace, within which is mounted a grate 5. The outside casing of the body 4 is preferably constructed with a metal covering 6 that incloses a fire-proof wall 7 and at the sides of the furnace is a supplemental fire-proof wall 8 located at a short distance from the out side wall to leave an intervening chamber 9. In the supplemental wall 8 are perforations 10 provided for the purpose of allowing the ingress of gas, when gas is the fuel employed in the furnace in place of other fuel burned upon the grate.

Pivoted in the side walls of the furnace is a frame 11, which supports piping 12 that extends by bends and return bends to points near the ends of the furnace and it is upon this piping that the sheet of iron is supported, in the furnace as will hereinafter be fully explained.

Connected to the ends of the piping out-

side of the furnace are hose or pipes 13 provided for the ingress and egress of a continuous supply of water through the piping 12 to keep the piping at a low temperature to prevent warping of the piping, and the frame 11 by the heat, which would result without the introduction of some cooling agent. The frame 11 is constructed with the pivots in order that it may be tilted in receiving the sheet iron from the rolls and tilted in return when it is desired to remove the sheet iron from the furnace, as will be presently explained in reciting the operation of this part of the furnace. Secured to the frame 11, or to the ends of the piping is a lever 14, moving in a guide 15, through the medium of which lever the frame and piping may be tilted as desired.

In the end of the furnace, at which the rolls A, B, are located is a door 16, pivoted at its central portion upon a rod 17, the construction being such that the lower side of the door is adapted to swing inward, and the upper side is adapted to swing outward, so that the sheet of iron may be readily passed into the furnace at the lower side of the door-way and out of the furnace at the upper side.

In rolling a sheet of iron, when it has been passed through the rolls, the frame 11 is tilted into the position shown by dotted lines in Fig. II, and the door 16 is tilted as shown by dotted lines in the same figure, to allow the passage of the sheet C (shown in Fig. II between the rolls and in dotted lines in its passage) into the furnace and onto the piping 12, when the frame 11 is, by means of the lever 14, tilted back to its normal position and the sheet after remaining the desired length of time in the furnace is passed out through the upper portion of the doorway over the roll A, from which it is taken by the operator and again presented to pass through the rolls and into the heating furnace as before, this process being repeated until the sheet has reached the desired reduction.

Located in the opposite end of the furnace from that in which the door 16 is located, is a pair of doors 18 provided for the introduction of fuel into the furnace and for the introduction of the tongs or other tool used to grasp the end of the sheet iron as it comes

from the rolls into the furnace and to pass it out from the upper portion of the doorway over the roll A.

At the sides of the furnace, mounted on the supplemental walls 8, are shelves 19 upon which the sheet iron may be laid to keep it in a heated condition when it is desired to roll a number of sheets into one, the sheets already rolled being bent over with one end upon the other and laid on the shelves on edge until another sheet or other sheets are rolled down to a desired thickness when they are all placed together and passed from the furnace to be rolled into one.

20 represents the cover of the furnace seated in a groove 21 and which is provided with a hook 22 by which the said cover may be raised when it is desired for any reason to get at the interior of the furnace from above. At one end of the cover is a chamber 23 providing communication from one side of the furnace to the other, the openings 24 in which chamber register with passage ways 25 that are in direct communication with the chambers 9. Connected to the chamber 23 are pipes 26 through which a supply of gas may enter the chamber 23 and pass into the passage ways and thence through the openings 10 into the interior of the furnace, where upon being lighted jets of flame are projected to heat the furnace in place of the employment of coke or other fuel, upon the grate 5.

29 represents flues connected to the sides of the furnace for the purpose of carrying off the smoke and gases from the furnace, which flues are carried down and connected to a main flue 27 that may be with a number of adjacent furnaces so that one main flue answers to carry the unconsumed products from any number of furnaces in use in near proximity to each other.

28 represents ash pit doors provided to allow of the removal of ashes from the furnace.

I have spoken of cold water as the medium employed to cool the piping 12 and prevent its warping, but it is evident other mediums might be employed in lieu of water, such, for instance, as a blast of cold air.

In place of coal, coke or gas to heat the furnace, oil may be used with the most satisfactory results.

My furnace is adaptable for use in rolling all kinds of metals, its use not being limited to rolling sheet iron. It is especially adaptable

in the rolling of aluminium, which it is very necessary should be kept at a uniform heat in the process of rolling.

I claim as my invention—

1. In a furnace, the combination of the walls, a frame pivoted in said walls, piping mounted on said frame, and flexible water connections on the ends of said piping arranged to provide ingress and egress of water and allow a rocking movement of said piping: substantially as described.

2. In a furnace, the combination of an outer wall, an inner supplemental wall, a chamber between said walls, perforations in said supplemental wall, furnace cover, a chamber located in said cover, gas supply pipes communicating with said chamber, and passages leading from said last mentioned chamber to the chamber between the walls: substantially as described.

3. In a furnace, the combination of an outer wall, an inner supplemental wall, a chamber between said walls, perforations in said supplemental wall, a removable furnace cover, a chamber located in said cover, gas supply pipes communicating with said chamber and passages leading from said last mentioned chamber to the chamber between the walls: substantially as described.

4. In a furnace, the combination of a pivoted frame mounted in the wall of said furnace, shelves mounted against the walls of the furnace, piping mounted on said pivoted frame and a flexible water supply connection attached to the ends of said piping: substantially as described.

5. In a furnace, the combination of a pivoted frame mounted in the wall of said furnace, piping mounted on said pivoted frame water supply connection attached to said piping, and a door 16 in the wall of the furnace mounted on a central pivot 17: substantially as described.

6. In a furnace, the combination of a pivoted frame mounted in the wall of the furnace, piping mounted on said frame water supply connection attached to said piping, a lever arranged to operate said pivoted frame and doors 16 and 18 at either end of the furnace: substantially as described.

WILLIAM E. HARRIS.

In presence of—

JOHN M. STULL,
WM. G. BALDWIN.