

(No Model.)

2 Sheets—Sheet 1.

W. H. BAILEY.
FURNACE FOR HEATING METALS.

No. 555,554.

Patented Mar. 3, 1896.

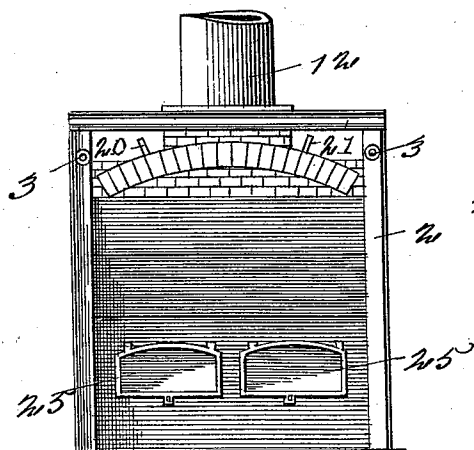
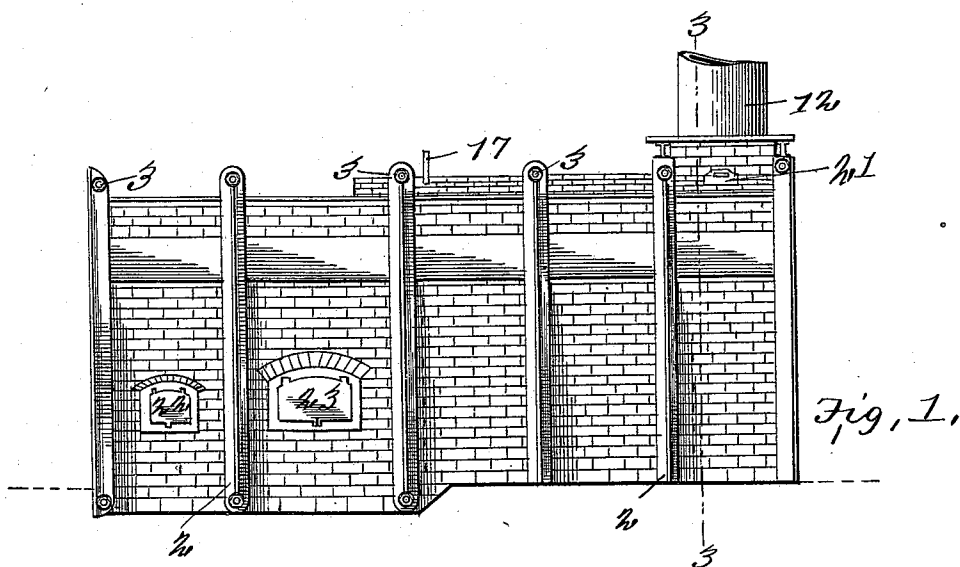


Fig. 2.

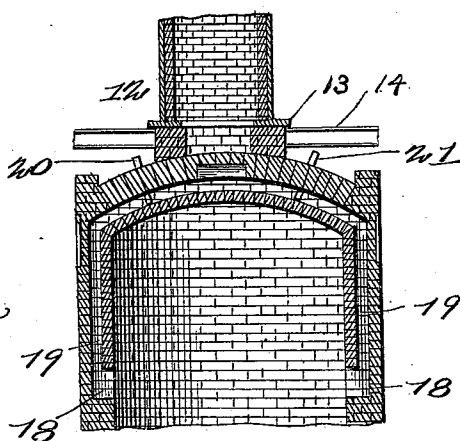


Fig. 3.

WITNESSES-

Wm. H. Nottingham
James C. Jester

INVENTOR

W. H. Bailey
By Nottingham & Bailey
Attys

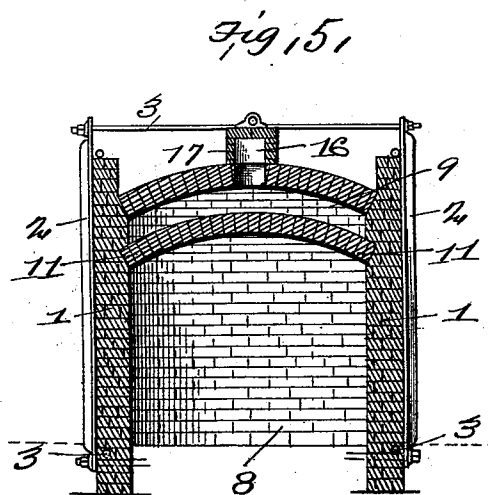
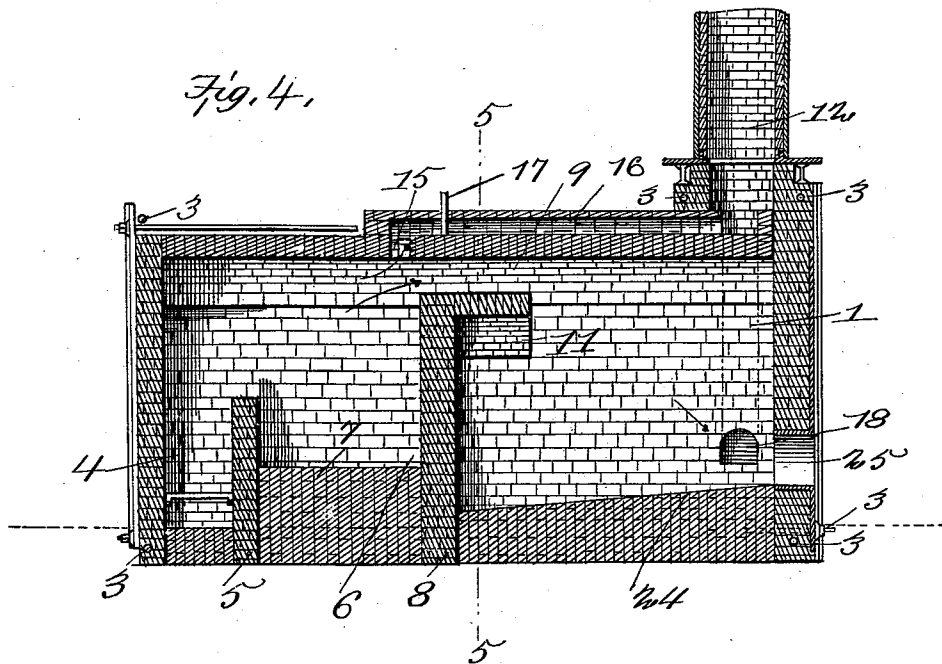
(No Model.)

2 Sheets—Sheet 2.

W. H. BAILEY.
FURNACE FOR HEATING METALS.

No. 555,554.

Patented Mar. 3, 1896.



WITNESSES-

Wm. H. Nottingham
James B. Jester

INVENTOR

W. H. Bailey
By Nottingham & Bailey
attys.

UNITED STATES PATENT OFFICE.

WILLIAM HENRY BAILEY, OF MUNCIE, INDIANA.

FURNACE FOR HEATING METALS.

SPECIFICATION forming part of Letters Patent No. 555,554, dated March 3, 1896.

Application filed March 5, 1895. Serial No. 540,615. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY BAILEY, a citizen of the United States, residing at Muncie, in the county of Delaware and State of Indiana, have invented certain new and useful Improvements in Furnaces for Heating Metals; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to certain new and useful improvements in furnaces for heating metal; and it consists of a furnace provided with two heating-chambers which communicate with each other by means of suitable flues, having arranged therein suitable dampers, whereby heat may be directed from one chamber to the other, as may be desired.

Heretofore it has been necessary to employ two furnaces for that class of mills commonly called "sheet-mills" and "tin-mills," one to heat the metal bars or billets before being rolled into sheets, previous to being rolled to proper gauge and finish.

It is the object of this invention to produce a single furnace in which both of the heating operations can be performed, utilizing the waste heat from one chamber of the furnace to the other and economizing space, as a single furnace can be made much more compact than two separate furnaces. Moreover, a single furnace can be managed with much less labor than two separate furnaces, which tends to economize the manufacture of metallic sheets. This object is attained by means of the structure illustrated in the accompanying drawings, in which—

Figure 1 represents a side elevation of my improved furnace; Fig. 2, a front elevation of the same; Fig. 3, a transverse vertical section on line 3 3 of Fig. 1; Fig. 4, a longitudinal vertical section, and Fig. 5 a transverse vertical section on line 5 5 of Fig. 4.

Referring to the drawings, the numeral 1 indicates the walls of the furnace, which are constructed of brickwork, braced and held together by the vertical T shape of angle-irons 2 and the brace-rods 3.

The numeral 4 indicates the fire or combustion chamber of the furnace, and 5 a bridge-wall built up from the floor, forming

the front of the fire-chamber and dividing the same from a heating-chamber 6, which I will designate as the "pair-heating" chamber. This chamber is situated immediately in front of said fire-chamber, and has an elevated hearth 7, built up of brickwork from the floor to form a support for the metal bars or billets which are to be heated in said chamber.

The numeral 8 indicates a bridge-wall constructed of brickwork and extending from the foundation of the furnace to near the upper part thereof, terminating below the top of the chamber to form a passage-way 9, between its upper edge and the roof, which leads into a second heating-chamber 10, which will be hereinafter referred to as the "sheet-heating" chamber.

The roof the furnace is arched from front to rear, as shown in Figs. 3, 4, and 5, and the sheet-heating chamber is formed with an arched bridge 11, which extends a short distance from the bridge-wall 8, forming a continuation of the passage-way 9. The front wall of this chamber, which is also the front wall of the furnace, is constructed of brickwork and has built upon it the smoke-stack 12, which is cylindrical in cross-section and lined with fire-brick. The stack is supported upon a flanged iron collar 13, which rests upon iron girders 14 supported by the brickwork of the furnace.

In the center of the arched roof of the furnace, at a point near the forward part of the pair-heating chamber, is an exit 15 communicating with a flue 16, which extends to and enters the smoke-stack at its base. This flue is provided with a damper 17 for controlling the escape of the products of combustion and regulating the draft of the furnace, and also for directing the heat from the pair-heating chamber into the sheet-heating chamber.

Each side wall of the sheet-heating chamber is provided with an exit 18, which communicates with a flue 19, extending upwardly through said side walls and the arched roof, and communicating with the smoke-flue 16. These flues are provided with dampers 20 and 21 for controlling and regulating the heat in the sheet-heating chamber, and also for controlling the escape of the products of combustion.

The combustion-chamber is provided with

the usual door 22 for firing, and the pair-heating chamber with a door 23 for charging and removal purposes, both doors being preferably at one side of the furnace.

5 The sheet-heating chamber is provided with an inclined bottom 24, inclining from front to rear, and doors 25 are provided at the front for the insertion and removal of the metal sheets.

10 The operation of the invention is as follows: The bars or billets of metal, which require a high temperature for working, are placed into the pair-heating chamber and heated in the usual manner. After being properly heated

15 the bars or billets are removed from the chamber and supplied in pairs to the rolls, when they are rolled into blanks or sheets of suitable size. These blanks or sheets are then placed in the sheet-heating chamber and reheated for further rolling and finishing.

20 The pair-heating chamber is of the usual construction employed in rolling-mills; but the heat which in this class of furnaces passes up through the flue with the products of combustion is utilized for heating the sheets, thereby effecting a great saving in fuel. In starting, when a high degree of heat is required for heating the bars or billets of metal, the products of combustion may be allowed to

25 pass directly to the smoke-stack. Afterward when good combustion is obtained the heat is directed through the passage-way 9 into the sheet-heating chamber to heat the sheets, the degree of heat in both chambers being regulated and controlled by the dampers.

35 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

40 1. A furnace for heating metals, comprising a single fire-chamber, a pair-heating chamber and a sheet-heating chamber, the fire-

chamber connected with the pair-heating chamber by a passage-way through the division-wall, and the pair-heating chamber connected with the sheet-heating chamber also by a passage-way, a smoke-stack separate from the several chambers but connected with the sheet-heating chamber by damper-controlled flues leading through the side walls of said chamber, and flues connecting the pair-heating chamber with the smoke-stack and controlled by dampers, whereby the products of combustion may be directed through said pair-heating chamber or through the sheet-heating chamber, as desired.

2. A furnace for heating metals, comprising a fire-chamber, a pair-heating chamber, and a sheet-heating chamber, the pair-heating chamber partially separated from the fire-chamber by a low wall, the sheet-heating chamber separated from the pair-heating chamber by a wall having an arched bridge extending therefrom into said sheet-heating chamber and a passage-way above said wall and bridge connecting the two chambers together, a smoke-stack separate from the several chambers, a flue leading from the pair-heating chamber through the crown of the furnace to the smoke-stack flues leading from the sheet-heating chamber through the side walls of said chamber to said smoke-stack, and dampers located in said flues, whereby the heat and products of combustion may be directed through first one heating-chamber and then the other, substantially as specified.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM HENRY BAILEY.

Witnesses:

ROSCOE C. GRIFFITH,
O. P. JONES.