No. 888,815. PATENTED MAY 26, 1908.

J. J. JONES.

FURNACE.

APPLICATION FILED OCT. 30, 1907.

3 SHEETS—SHEET 1.

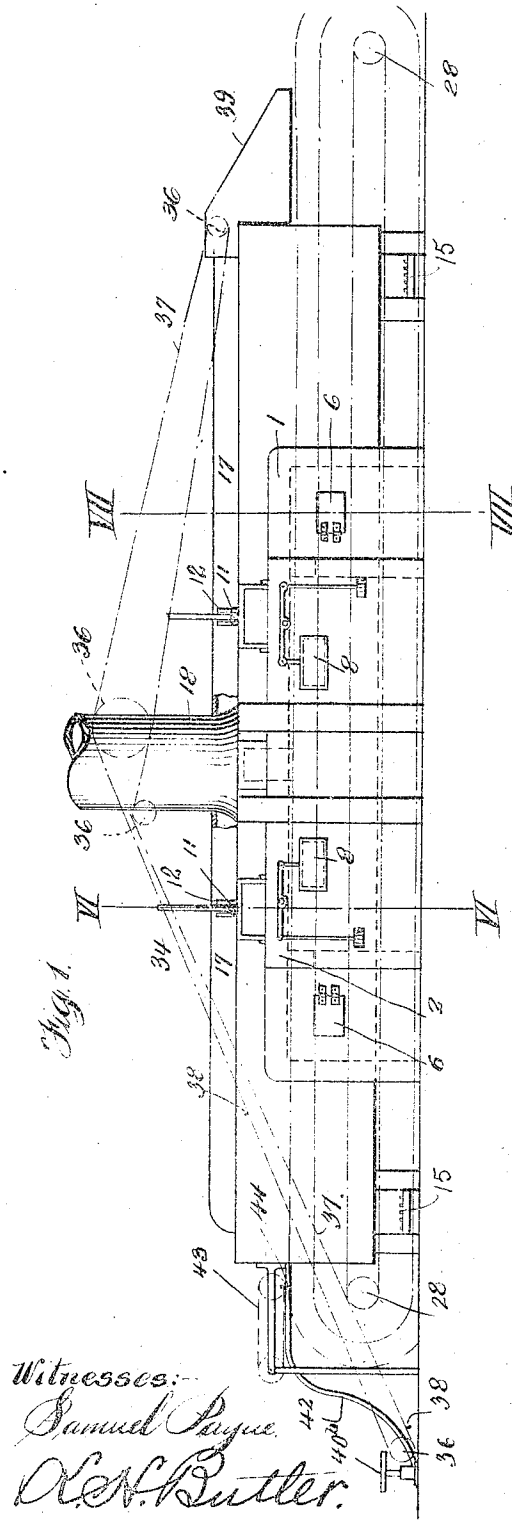


Fig. 1.

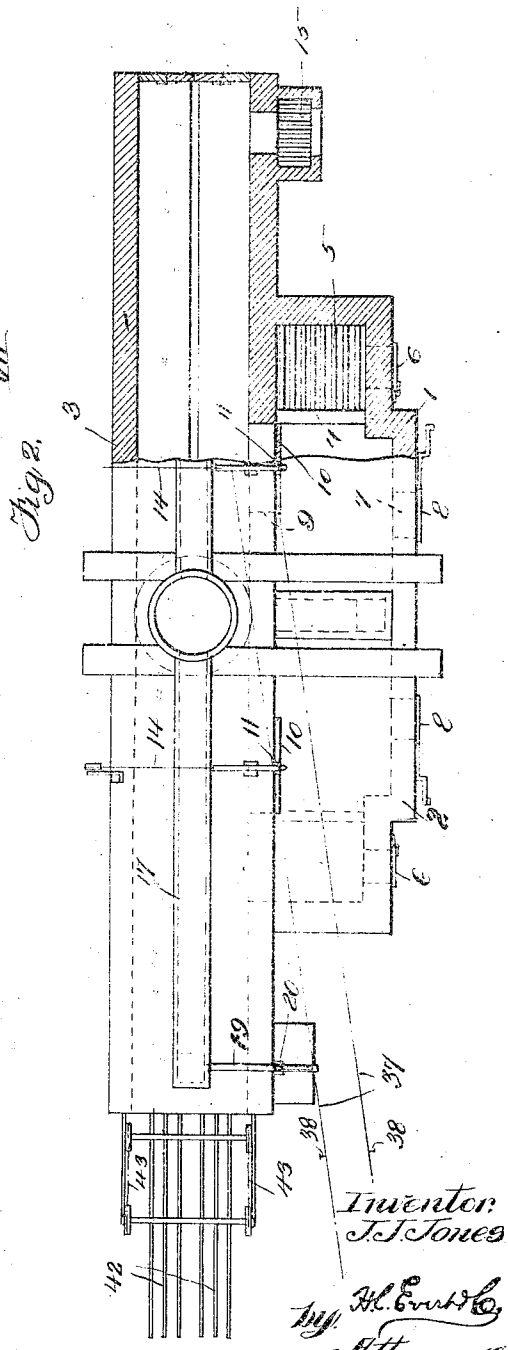


Fig. 2.

Witnesses:-
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K. H. Butler.

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3 SHEETS—SHEET 2.

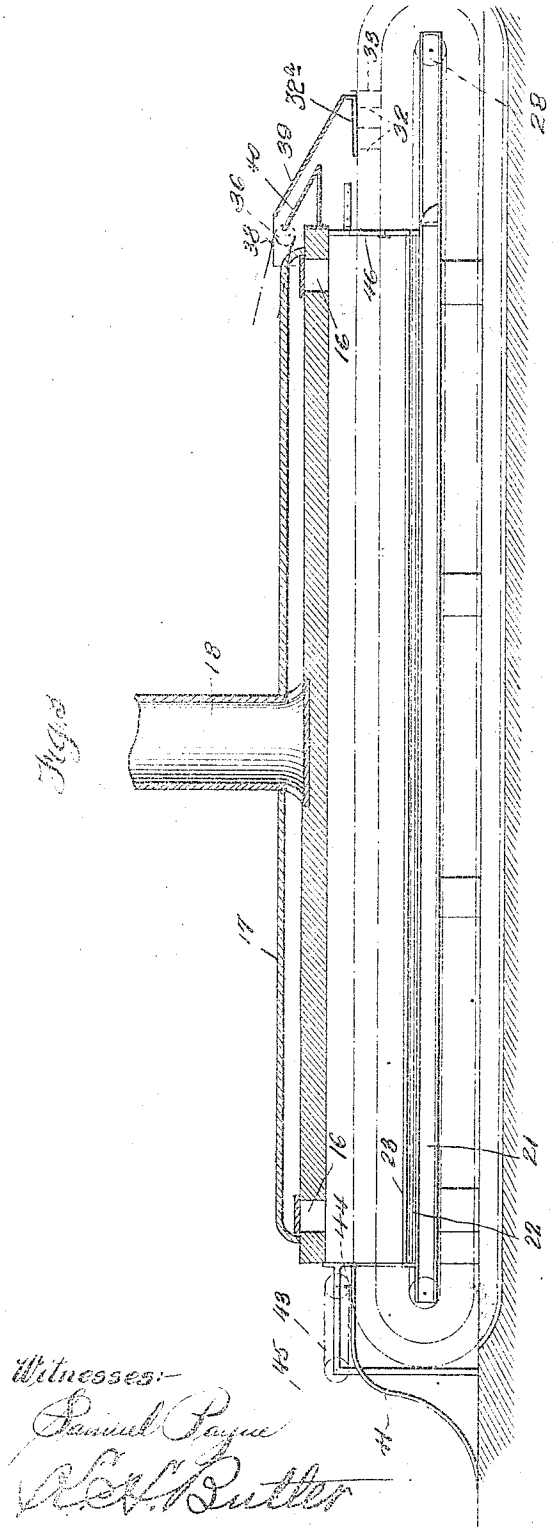


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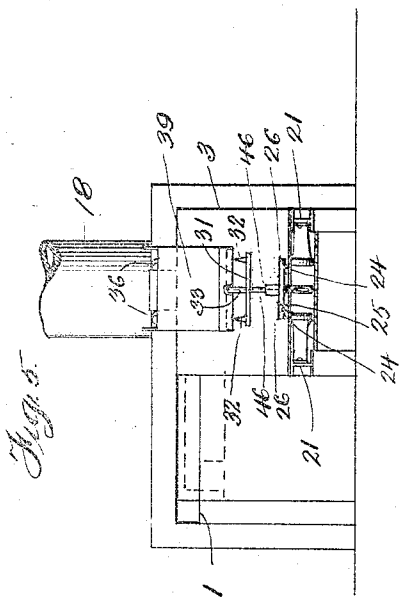


Fig. 5.

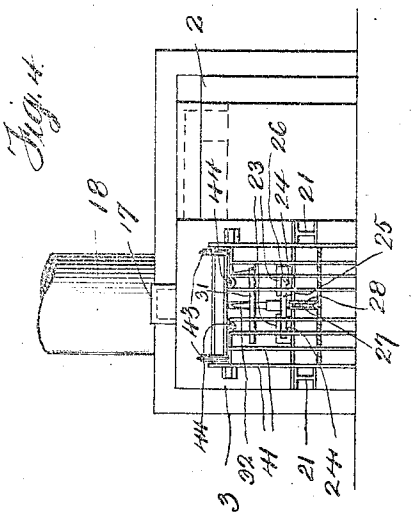


Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 6.

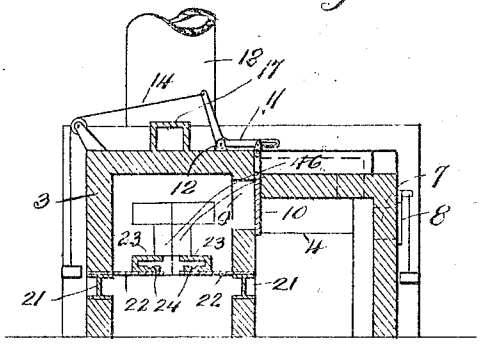


Fig. 7.

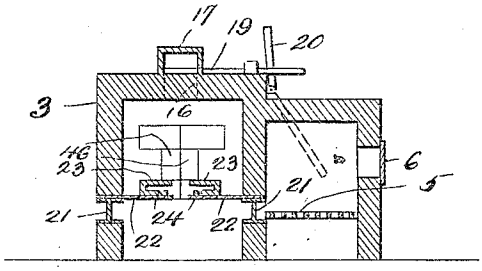


Fig. 8.

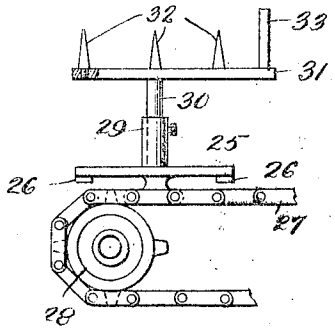


Fig. 9.

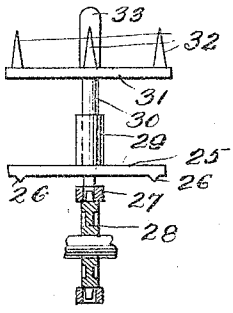


Fig. 10.

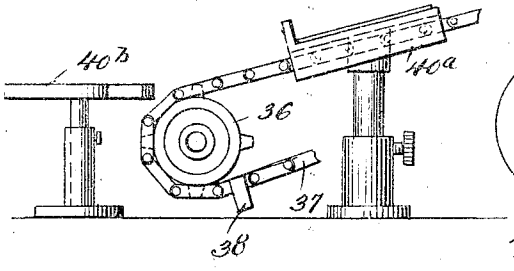
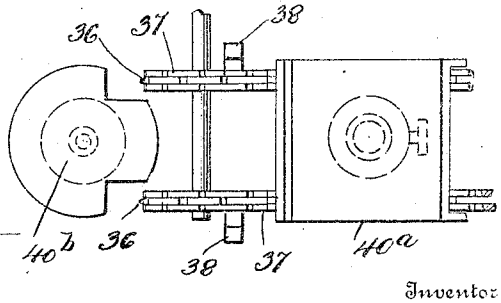


Fig. 11.



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UNITED STATES PATENT OFFICE.

JOHN J. JONES, OF NEW CASTLE, PENNSYLVANIA.

FURNACE.

No. 888,815. Specification of Letters Patent. Patented May 26, 1908.

Application filed October 30, 1907. Serial No. 399,955.

To all whom it may concern:

Be it known that I, JOHN J. JONES, a citizen of the United States of America, residing at New Castle, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to furnaces, particularly designed for conveying and heating plates for sheet tin and black plate mills.

The primary object of this invention is to combine a plate heating furnace with a "pair" furnace whereby a saving of labor and fuel will be accomplished.

Another object of this invention is to provide a furnace that can be easily fired to produce a uniform heat throughout the plate heating furnace, and thereby obtain a high grade of work without damaging the iron or producing a waste product.

A further object of this invention is to provide a novel furnace in which pairs of billets can be thoroughly heated, and the heat from said furnace utilized for heating packs or sheets of iron, and by the novel distribution of heat within the plate heating furnace and within the pair furnace, the billets are prevented from scaling and are properly heated preparatory to rolling.

A still further object of this invention is to combine furnaces in such manner that a cessation in the operation of the furnace will not interfere with the adjoining furnaces.

A still further object of this invention is to provide a furnace for continuously heating packs of plates, a novel conveyer being used for this purpose, which supports the packs of plates whereby they will be evenly subjected to the heat within the furnace and produce a better quality of goods.

With the above and other objects in view which will more readily appear as the invention is better understood, the same consists in the novel construction, combination and arrangement of parts to be hereinafter described, and then specifically pointed out in the appended claims.

Referring to the drawings: Figure 1 is a side elevation of a furnace, Fig. 2 is a plan of the same, partly in section, Fig. 3 is a longitudinal sectional view of a furnace, Fig. 4 is a rear end view of the same, Fig. 5 is a view of the front end of a furnace, Fig. 6 is a cross sectional view, taken on the line VI—VI of Fig. 1, Fig. 7 is a similar view taken on the line VII—VII of Fig. 1, Fig. 8 is an elevation of a portion of a horizontal conveyer, Fig. 9 is a cross sectional view of the same, Fig. 10 is an elevation of a portion of an inclined conveyer carrier, and Fig. 11 is a plan of the same.

In the accompanying drawings, 1 and 2 designate what I have termed "pair" furnaces, these furnaces adjoining one another, and an oblong plate heating furnace 3 through which the plates are conveyed in a manner as hereinafter referred to. The furnaces 2 are constructed with bridge walls 4, grates 5, and fire doors 6, whereby fires can be built upon the grates 5 and fed from the exterior of the furnaces. The furnaces are also provided with openings 7 normally closed by balanced doors 8, these openings permitting of billets being placed in the furnace, preferably in pairs, to be heated. Smoke, gas, and products of combustion, are carried from the furnaces 1 and 2 through opening 9, these openings being closed by vertically disposed gates 10 connecting with bell-crank levers 11, pivotally mounted upon the top of the furnace 3, as at 12, said levers connecting with cables 14, suspended from the side of the furnace 3, opposite the furnaces 1 and 2.

In using the gates 10 I can close the furnace 3 when it is desired to make repairs or alterations, and in order that the same can be accomplished with the furnaces 1 and 2, and still maintain the furnace 3 in operation, I provide auxiliary grate bars 15 at the ends of the furnace 3, fires being built upon said grate bars at any time it is desired to operate the furnace 3 and the pendant of the furnaces 1 and 2 or to increase the heat within the furnace 3.

The products of combustion or the heated air entering the furnace 3 through the openings 9 escapes at the ends of the furnace 3 through openings 16 into longitudinally disposed flues 17, communicating with a stack or chimney 18, located centrally of the furnace 3. The openings 16 are closed by slides, operated through the medium of pivoted levers 20 and carried by the side of the furnace 3 at the ends thereof. The outer ends of the slides 19 are provided with openings, to receive the upper ends of the levers 20.

In constructing the furnace 3, I use eye-beams 21 carrying inwardly projecting plates 22 for supporting confronting channel-shaped

guides 23, said guides being provided with longitudinal grooves 24. Adapted to slide in the guides 23 are conveyer plates 25, provided with depending lugs 26 to ride in the grooves 24 of the guides. The plates 26 are carried by an endless sprocket chain 27 traveling over sprocket wheels 28, arranged at the ends of the furnace 3, these sprocket wheels being suitably driven, and for clearness of illustration, are illustrated diagrammatically in Fig. 1 of the drawings. Each conveyer plate is provided with a socket 29 and with a depending stem 30 of a conveyer frame 31, each frame having detachable pins 32 and a catch pin 33, the latter being of a greater height than the former. The pins 32 are adapted to support plates or a pack of plates and in being elevated above the frame 31 as they pass through the furnace 3, these plates will be subjected to heat upon all sides.

In practice, the plates are carried through the furnace from the front end thereof to the rear end thereof, and in order to convey the plates to the front end of the furnace from the rear end thereof, I employ an inclined conveyer 34. This conveyer is constructed of suitable driven sprocket wheels 36, endless chains 37, having outwardly extending carriers 38. The conveyer 34 extends from the rear end of the furnace 3, at one side thereof, upwardly at an angle to said furnace, passing over sprocket wheels suitably supported above the furnace, and other sprocket wheels located at the front end of the furnace 3, and suitably supported in the metallic casing 39, containing an inclined plate 40, upon which packs of plates are delivered, from where the plates slide downwardly upon the plate 32^a, said plate being slotted to permit of the catch pins 33 passing therethrough to engage a plate.

In close proximity to the rear end of said conveyer is arranged an adjustable table 40^a upon which plates are placed to be engaged by the carriers 38, and conveyed to the front end of the furnace. Another adjustable table 40^b is located adjacent to the conveyer, this table being employed for supporting plates, either to be placed upon the table 40^a or carried to rolls.

For removing the packs of plates from the horizontal conveyer, after they have passed through the furnace 3, I arrange a plurality of delivery rails 42 at the rear end of the furnace 3 and an endless chain 43, driven from a suitable source of energy. The chain 43 carries kickers 44 to engage the packs of plates and move the same to the delivery rails 42, from where they slide downwardly.

At the front and rear ends of the furnace, I use hinged doors 46 for normally closing the openings through which the horizontal conveyer passes, these doors swinging whenever the plates and frames of said conveyer passes into the furnace 3. In lieu of these hinged doors I can use doors that are manually elevated, said doors being particularly designed for closing the furnace while the temperature is being raised therein.

It is though that those skilled in the art of manufacturing plates will readily realize the many advantages of my improved combined and continuous furnace, and I desire it to be understood that such structural changes as are permissible by the appended claims can be resorted to without departing from the spirit and scope of the invention.

Having now described my invention, what I claim as new, is:—

1. A furnace consisting of an oblong structure having longitudinally disposed flues in its top terminating in a stack, adjoining pairing furnaces located at one side of said structure and communicating therewith, gates controlling said communication, auxiliary grate bars located at the ends of said structure, a horizontal plate conveyer passing through said oblong structure and comprising a plurality of conveyer frames, and pins carried by said frames; delivery rails arranged at one end of said structure, movable kickers for removing plates from said conveyer to said rails, an inclined conveyer arranged at one side of said structure and at an angle thereto for conveying plates to the front end of said structure, a casing for delivering plates from the last mentioned conveyer to said horizontal conveyer, adjustable tables arranged at the rear end of said inclined conveyer, horizontal doors normally closing the ends of said structure, and means within said structure for guiding said horizontal conveyer, substantially as described.

2. A furnace consisting of an oblong structure, two adjoining pair furnaces communicating with said structure, gates controlling said communication, auxiliary grate bars located at the ends of said structure, a horizontal plate conveyer passing through said oblong structure and comprising a plurality of conveyer frames, and pins carried by said frames; delivery rails arranged at one end of said structure, movable kickers for removing plates from said conveyer to said rails, an inclined conveyer arranged at one side of said structure and at an angle thereto for conveying plate to the front end of said structure, a casing for delivering plates from the last mentioned conveyer to said horizontal conveyer, adjustable tables arranged at the rear end of said inclined conveyer, hinged doors normally closing the ends of said structure, and means within said structure for guiding said horizontal conveyer, substantially as described.

3. A furnace embodying an oblong structure, adjoining pairing furnaces communicating with said structure, gates controlling said communication, a horizontal plate conveyer passing through said furnace, said conveyer

comprising an endless sprocket chain, frames, and pins carried thereby, delivery rails at the rear end of said structure, an inclined conveyer arranged at one side of said structure for delivering plates to the front end of said furnace, means for feeding plates from said inclined conveyer to said horizontal conveyer, and means for removing plates from said horizontal conveyer.

4. A furnace embodying an oblong structure, adjoining pairing furnaces communicating with said structure, gates controlling said communication, a horizontal plate conveyer passing through said furnace, delivery rails at the rear end of said structure, an inclined conveyer arranged at one side of said structure for delivering plates to the front end of said furnace, means for feeding plates from said inclined conveyer to said horizontal conveyer, and means for removing plates from said horizontal conveyer.

5. A furnace embodying an oblong structure, adjoining pairing furnaces communicating with said structure, a horizontal plate conveyer passing through said furnace, delivery rails at the rear end of said structure, an inclined conveyer arranged at one side of said structure for delivering plates to the front end of said furnace, means for feeding plates from said inclined conveyer to said horizontal conveyer, and means for removing plates from said horizontal conveyer.

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

JOHN J. JONES.

Witnesses:
MAX H. SROLOVITZ,
A. J. TRIGG.