J. COOPER.

HEATING FURNACE.

APPLICATION FILED AUG. 18, 1920.

1,362,232.

Patented Dec. 14, 1920.

2 SHEETS—SHEET 1.

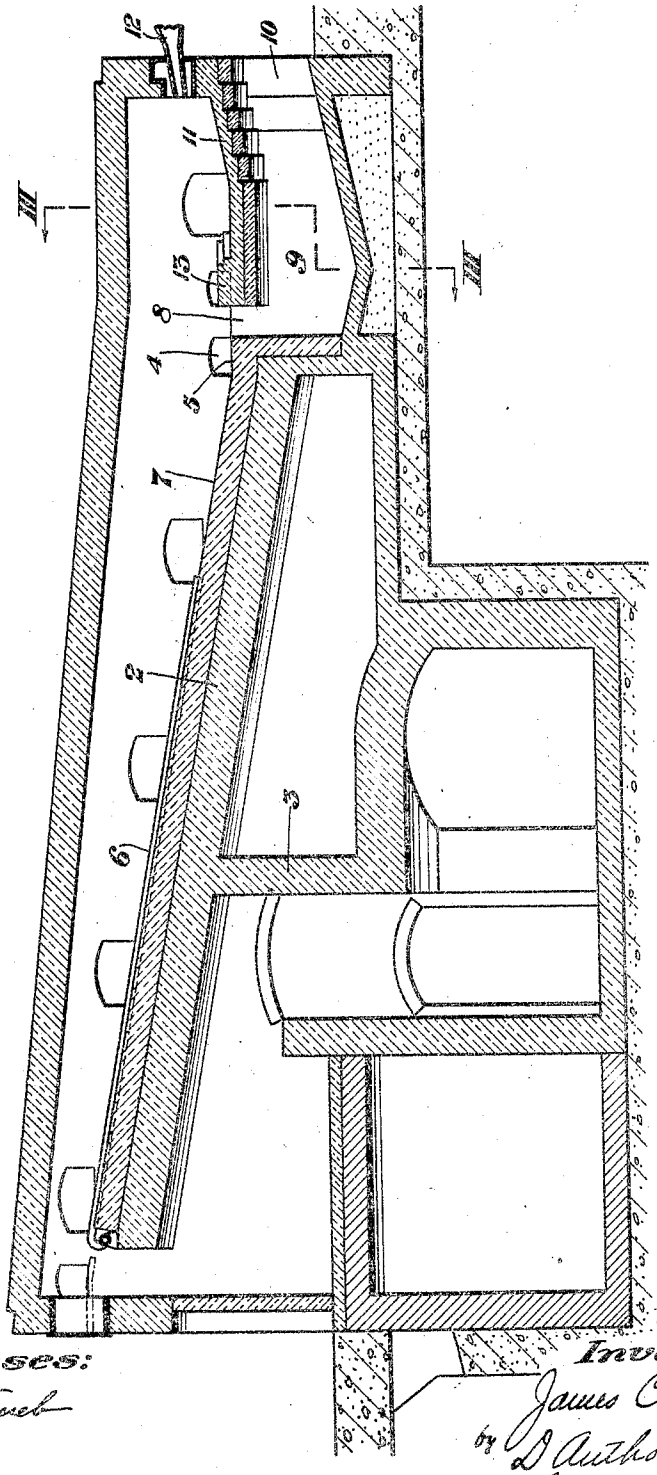


Fig. 1.

Witnesses:
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2 SHEETS—SHEET 2.

Fig. 2.

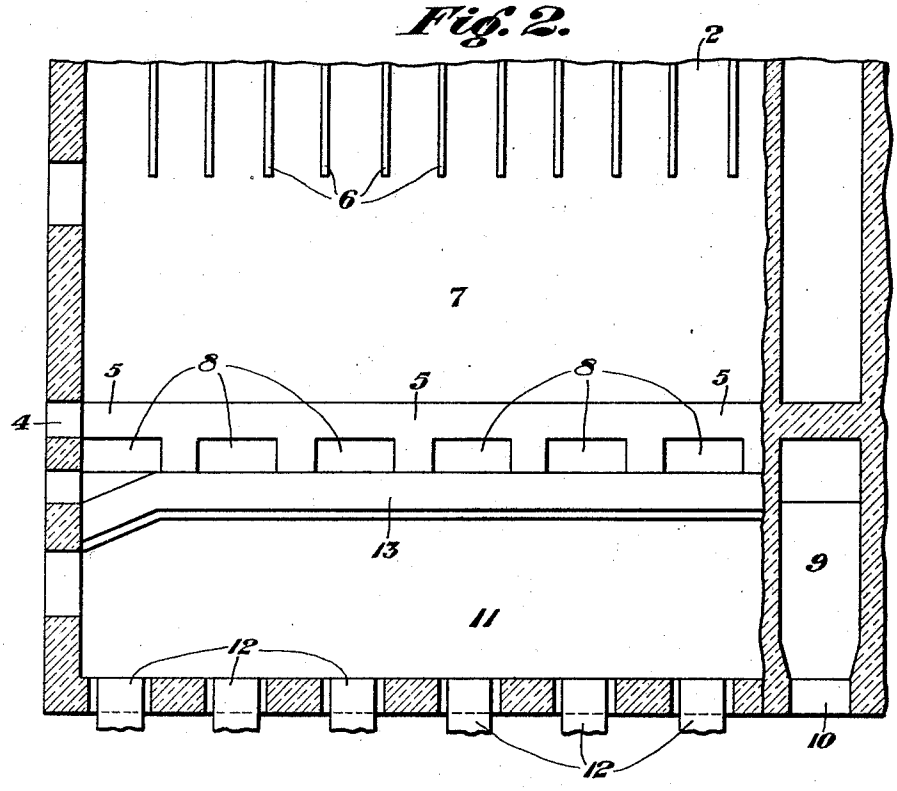
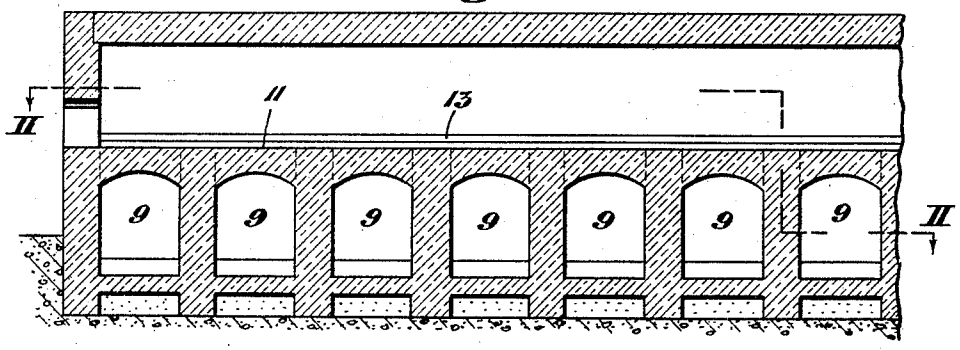


Fig. 3.



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UNITED STATES PATENT OFFICE.

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HEATING-FURNACE.

1,362,232. Specification of Letters Patent. Patented Dec. 14, 1920.

Application filed August 18, 1920. Serial No. 404,309.

To all whom it may concern:

Be it known that I, JAMES COOPER, a citizen of the United States, and resident of Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Heating-Furnaces, of which the following is a specification.

This invention relates to certain improvements in what are known as "continuous" heating furnaces, *i. e.*—furnaces into which the articles to be heated are charged adjacent to one end, gradually moved through the furnace and are discharged at or near its opposite end.

Ordinarily with such furnaces, a plurality of water cooled pipes or rails are arranged to project slightly above the hearth or floor for supporting the billets or other articles during the passage thereof through the furnaces, said pipes or rails terminating short of the forward end of the hearth or floor to provide a receiving bed from which the billets are successively removed through a doorway in the furnace side wall. Experience has shown that slag and cinder will collect along the floor in considerable quantities and be pushed forward by the billets being heated. At times this collection of slag and cinder accumulates rapidly and retards or prevents the withdrawal of the heated billets, thereby causing considerable delay until the slag and cinder has been removed manually, and entailing considerable laborious work in removing such accumulations.

One object of my invention is the provision in continuous heating furnaces of means for preventing accumulations of slag or cinder from piling up in front of or adjacent to the discharge opening or doorway through which the heated materials are removed from the furnace.

Another object of the invention is to provide a continuous heating furnace having the novel construction, arrangement and combination of parts, shown in the drawings, to be described in detail hereinafter, and specifically pointed out in the appended claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a longitudinal vertical section of a furnace, partly broken away, showing the invention.

Fig. 2 is a sectional plan view thereof on the line II—II of Fig. 3.

Fig. 3 is a vertical cross section on the line III—III of Fig. 1.

In practice the furnace is constructed as regards the exterior walls and base thereof, in the usual or any suitable manner. A hearth or floor 2 is supported on transverse piers 3, and is inclined from the rear end of the furnace downwardly on an angle to a point in line with the discharge door 4 where a flat portion 5 is formed.

A plurality of rails or pipes 6 are embedded in the floor 2 and terminate an appreciable distance short of the flat portion 5 forming a receiving bed 7. The rails or pipes 6 will be connected to supply and discharge pipes, so as to insure a circulation of water or other cooling fluid therethrough in any suitable manner known in the art.

As the heated articles move along the rails or pipes 6, the portions of such articles that are in contact with the rails or pipes will remain comparatively cool, due to the cooled condition of said rails. However, when the articles move onto the receiving bed these cool spots will become heated to the same degree as the remainder of the article.

The floor 2 terminates slightly beyond the forward side wall of the door 4, and a plurality of transverse openings 8 are arranged at this point, each opening into a pit or chamber 9 which extends forward to the end wall of the furnace, and has a door 10 opening through said wall.

A suitable fire-wall or arch 11 is arranged forward of the openings 8 and over the pits 9. A plurality of fuel burners 12 are arranged in the forward end wall adapted to direct a heating flame against the fire-wall or arch 11 which has an upward projection 13 at its rear edge to direct the flames upward along the inclined hearth 2.

In operation, the billets or other articles to be heated are placed in the rear end of the furnace and moved forward along the pipes or rails 6, and since these pipes or rails are only slightly above the floor 2, any slag or cinder deposited will be pushed forward by the articles. Additional slag or cinder is deposited on the receiving bed 7 and is also pushed forward until it reaches the flat or level portion 5 of the floor.

When the articles reach the flat portion 5 of the floor 2, they are discharged transversely through the door 4, and as the cinder or slag is pushed forward, it will fall through the openings 8 into the pits or

chambers 9, thereby preventing any quantity of cinder or slag piling on the receiving bed 7. The cinder or slag may be removed from the pits or chambers 9 through the doors 10 as desired.

I claim:—

1. A heating furnace for billets or the like, having a floor inclined downwardly toward the discharge end, said billets being adapted to be advanced along said floor, and said floor being provided with a plurality of transverse openings adjacent its forward end through which slag, and the like may fall.

2. A heating furnace for billets or the like, having a floor inclined downwardly toward the discharge end, said billets being adapted to be advanced along said floor, and said floor being provided with a plurality of transverse openings adjacent its forward end through which slag, and the like may fall, and a pit formed below each of said openings to catch the slag, or the like, each of said pits being provided with a doorway opening through the forward end wall of said furnace through which the slag may be withdrawn.

3. A heating furnace for billets or the like, having a floor inclined downwardly toward the forward or discharge end, means embedded in a portion of said floor for supporting said billets slightly thereabove, said billets being advanced along said means and along said floor, and said floor being provided with a plurality of transversely extending openings adjacent its forward end through which slag, and the like may be discharged, and a pit arranged below each of said openings to catch the slag, each of said pits being provided with a doorway opening through the forward end wall of said furnace through which the slag may be withdrawn.

In testimony whereof I have hereunto signed my name.

JAMES COOPER.