April 12, 1938. W. W. DENNIS ET AL 2,113,681

HEATING FURNACE

Filed March 24, 1937

FIG. 1.

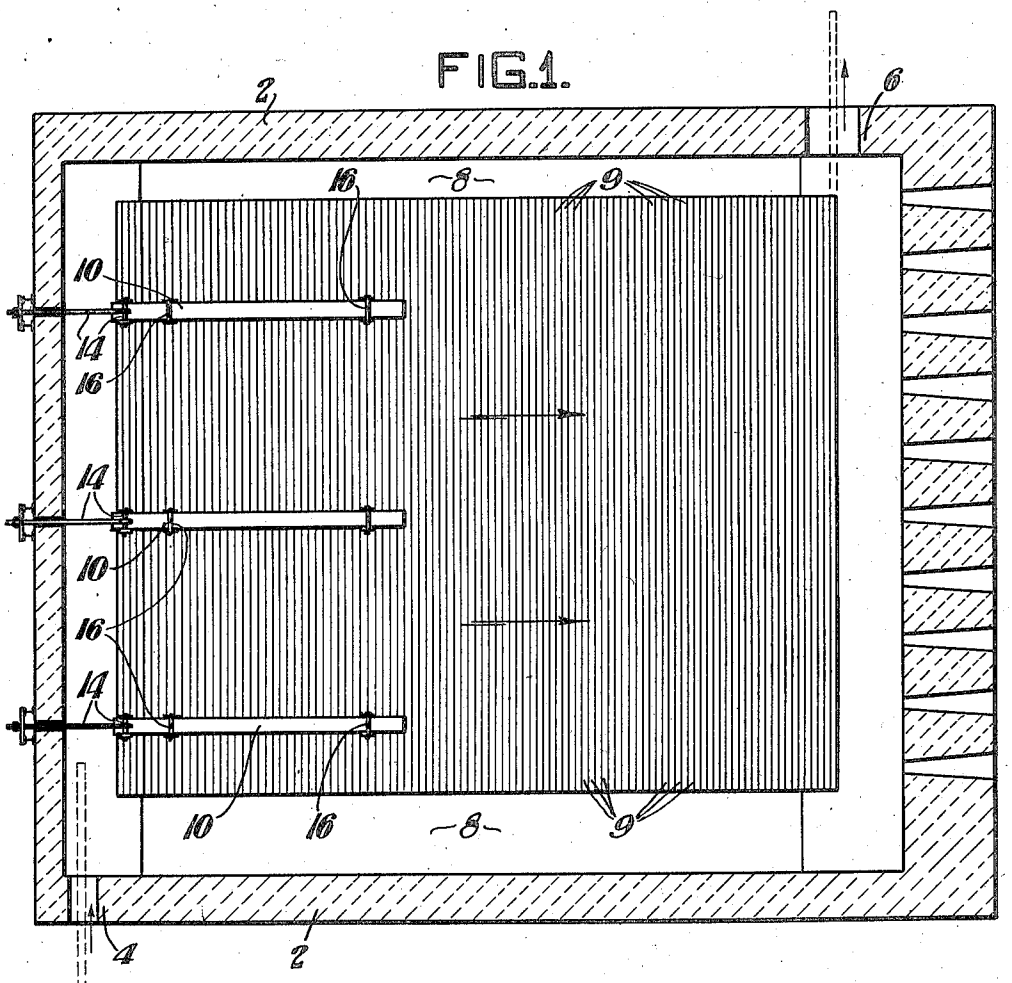
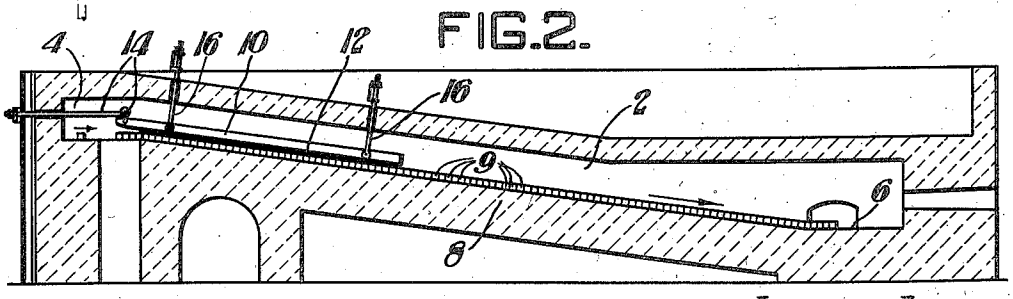


FIG. 2.



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HEATING FURNACE

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3 Claims. (Cl. 263—6)

This invention particularly relates to heating furnaces provided with apparatus for preventing small billets or the like from buckling when being pushed therethrough.

As the sides of the grooves in rolls wear away from use, they become concave and billets having slightly convex surfaces are produced. When these billets are charged side by side in reheating furnaces, and an attempt to push them therethrough is made, they have a tendency to rock on the convex surfaces and buckle out of line, forming a jumbled mass. If the billets buckle they should immediately be removed from the heating furnace to prevent them becoming misshapened and bent due to their own weight; but even then, in many cases, they must be straightened before they can be recharged in the furnace.

An object of this invention is to provide means for facilitating the passage of billets through heating furnaces.

The above and further objects will be made apparent by referring to the following description and the accompanying drawing, in which:

Figure 1 is a plan of one embodiment of our invention; and,

Figure 2 is an elevation of Figure 1.

Referring more particularly to the drawing, the numeral 2 indicates a heating furnace which has a charging end 4 and a discharging end 6. A hearth 8 supports billets 9, or the like, that are placed in the heating furnace 2. Any billets, or the like, that are placed in the heating furnace 2 are moved therethrough by suitable means (not shown), which are adapted to exert pressure upon the last billets placed in the heating furnace 2 and force all of the billets 9 toward the discharging end 6. This pressure upon the billets 9 causes a tendency to buckle, particularly if they have convex surfaces.

In order to prevent the billets 9 from buckling when force is exerted on them, a plurality of heavy metal bars 10, provided with flat bottom surfaces 12, are secured in the billet heating furnace 2 at the charging end 4; in some cases only one metal bar may be required. The flat bottom surfaces 12 are preferably relieved or terminate in upwardly directed curves adjacent the charging end 4 and those ends of the bars 10 are pivotally anchored in the heating furnace 2 by any suitable devices, such as eye-bolts and hangers 14. The ends of the bars 10 are supported by eye-bolts 16 that engage with means on the bars 10 to prevent the bars 10 from bearing upon the hearth 8. The bars 10 are preferably secured substantially parallel to the direction of movement of the billets 9 through the heating furnace 2, but they must be mounted to permit their surfaces 12 to be parallel to the surface of the hearth 8. The surfaces 12 ordinarily should be spaced from the hearth 8 a distance that is slightly less than the thickness of the billets 9 placed thereon. By mounting the bars 10 in this manner, they float upon, or are supported by, the upper surfaces of the billets 9. If the heating furnace is to heat varying sized billets, the means that mount the bars 10 must be adjustable so that the bars 10 can be placed in the same position relative to any billets placed in the heating furnace.

In some cases, it may be desirable to mount the bars 10 so that they do not ordinarily contact the billets 9 placed in the heating furnace. The bars 10 should then be positively supported parallel to but slightly above the billets 9 so that the billets 9 would still be prevented from buckling by immediately striking the fixed bars 10.

As the tendency of the billets 9 to buckle is most pronounced when they are adjacent the charging end 4, the bars 10 ordinarily need extend but a fraction of the length of the heating furnace.

While we have shown and described a specific embodiment of the invention, it will be understood that we do not wish to be limited exactly thereto, since various modifications of the invention may be made without departing from the scope thereof, as defined by the following claims.

We claim:

1. A heating furnace for billets or the like having a charging and a discharging end and a hearth over which said billets are moved, said heating furnace being provided with means for pushing said billets therethrough, in combination with at least one heavy bar, means pivotally securing one end of said bar on the inside of said furnace adjacent its charging end, said bar being positioned substantially parallel to said hearth at a distance therefrom slightly less than the thickness of the billets to be placed thereon, and yieldable means secured to the opposite end of said bar to prevent said bar from dropping upon said hearth whereby said bar will float upon the upper surfaces of the billets when they are placed upon said hearth.

2. A heating furnace for billets or the like having a charging and a discharging end and a hearth over which said billets are moved, said heating furnace being provided with means for pushing said billets therethrough, in combination with a plurality of heavy metal bars provided

with flat bottom surfaces that terminate in an upwardly directed curve at one end of each of said bars, means pivotally securing the curved ends of said bars on the inside of said furnace adjacent its charging end, said bars being normally positioned to permit their flat surfaces to be parallel to said hearth at a distance therefrom slightly less than the thickness of the billets to be placed thereon, and adjustable yieldable means secured to the ends of said bars to prevent said bars from dropping upon said hearth whereby said bars will float upon the upper surfaces of the billets when they are placed upon said hearth.

3. In a continuous furnace for heating billets, said furnace including a charging end, a discharging end, a hearth over which the billets are adapted to move and means for pushing the billets therethrough, a plurality of heavy metal bars disposed therein, each of said bars having a substantially flat bottom surface being relieved at one end and being normally spaced from the hearth, each of said bars being loosely pivoted at its relieved end to eye-bolts attached to the furnace adjacent the charging end thereof and being adjustably attached to at least one eye-bolt at its opposite end which is yieldably attached to the top of the furnace, said billets adapted to cam said bars upwardly upon progressively entering thereunder and into said furnace so that the bottom surface of said bars rests upon said billets, the weight of the same being adapted to keep said billets from buckling as they pass through the furnace.

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