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HEATING APPARATUS

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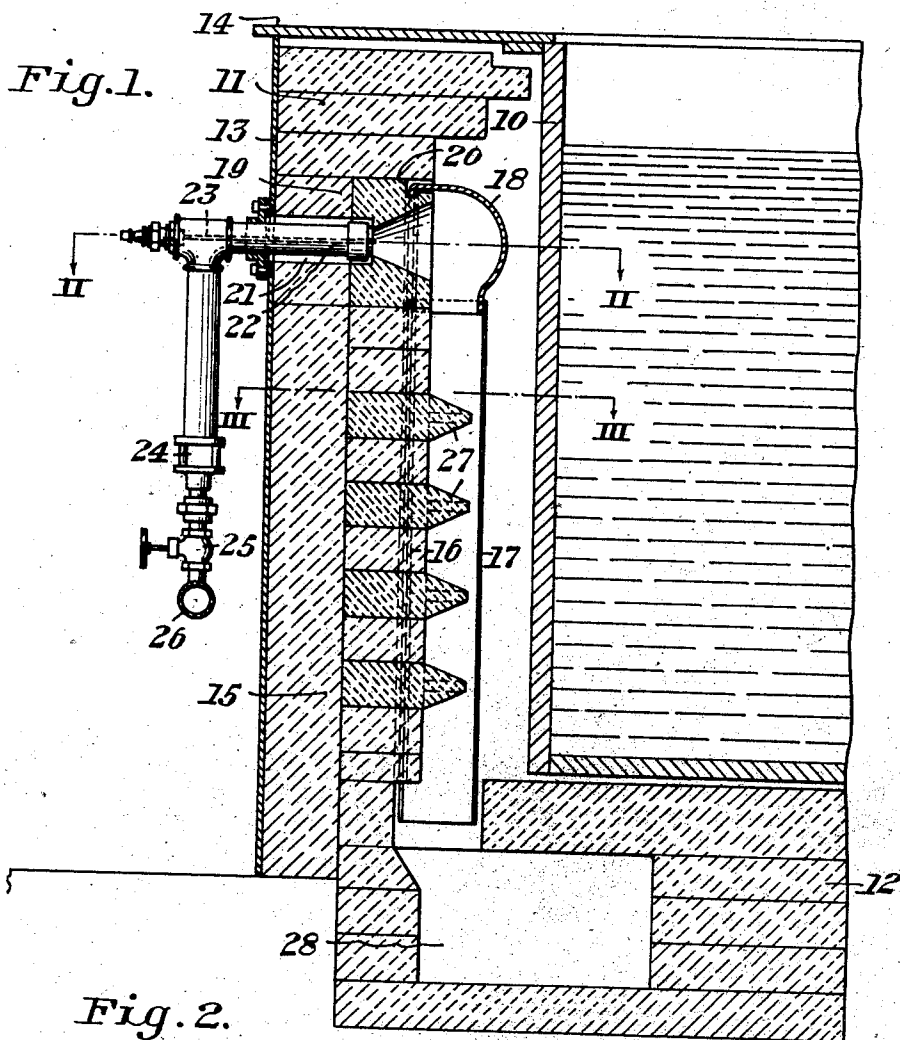


Fig. 2.

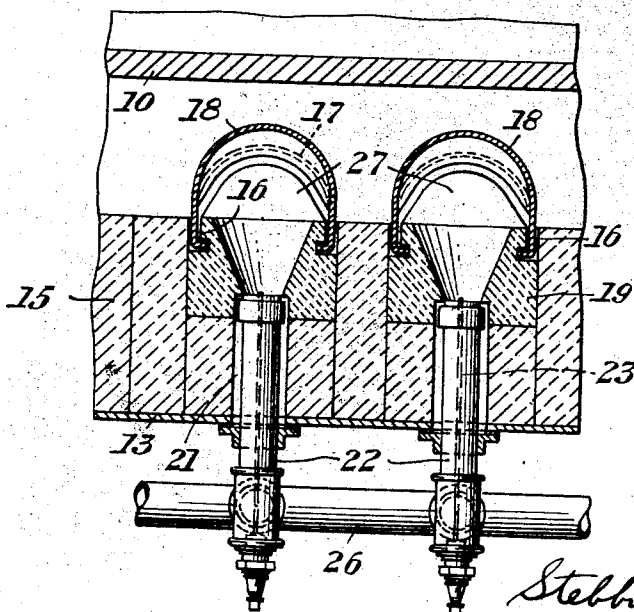
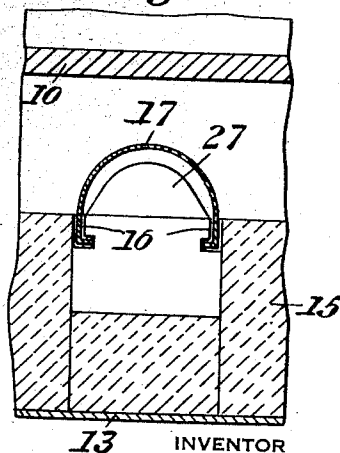


Fig. 3.



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UNITED STATES PATENT OFFICE

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HEATING APPARATUS

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4 Claims. (Cl. 263—14)

This invention relates generally to heating apparatus and particularly to apparatus for heating a mass of material by radiation from heat exchange tubes to which heating fluids such as hot combustion gases are supplied.

Radiant heat exchange tubes have been widely used for various heating applications. The present invention concerns particularly the heating of a mass enclosed within a setting of refractory brick. Specifically, the invention is an improvement on the structure disclosed in Wilson Patent 2,088,103 but, like the latter, is applicable to other uses than the typical installation shown, viz., a galvanizing pot.

The object of the present invention is to provide a radiant heater of improved design which can be manufactured at relatively low cost. Other novel features and advantages of the invention will be pointed out in the course of the following detailed description. Briefly stated, the heating apparatus of my invention comprises a generally trough-shaped radiating member, preferably of metal, disposed with its edges adjacent a refractory wall enclosing the mass to be heated, such as a galvanizing pot. The radiant member with a portion of the wall defines a passage for heating fluids which may conveniently be supplied thereto by a burner of suitable construction.

The accompanying drawing illustrates a preferred embodiment of the invention as applied to the heating of a galvanizing pot or the like. In the drawing:

Fig. 1 is a partial transverse section through a galvanizing pot having the invention incorporated therein;

Fig. 2 is a partial section through the brick setting enclosing the pot, substantially along the plane of line II—II of Fig. 1; line I—I of Fig. 2 indicates generally the plane on which the section of Fig. 1 is taken; and

Fig. 3 is a sectional view taken along the plane of line III—III of Fig. 1.

Referring now in detail to the drawing, a galvanizing pot 10 is disposed within a refractory setting 11. The setting includes side and end walls and a pier 12 on which the pot 10 is disposed. The setting is built up of refractory brick in the known manner and is enclosed within sheathing plates 13. A marginal plate 14 overlies the walls of the setting and extends around the pot 10.

The side walls of the setting 11, one of which is indicated at 15, are provided with a plurality of slots 16 extending substantially vertically thereof. As shown, the slots are L-shaped in sec-

tion and may conveniently be provided by laying up notched bricks in tiers.

Trough-shaped heat radiating members 17 have their edges disposed within the slots 16. The edges of the members 17 are L-shaped whereby they engage behind the overhanging portions of the brick defining the slots. The members 17 may conveniently be installed after the brick setting has been built up substantially to the height of said members, merely by sliding the latter downwardly after aligning their bent-over edges with the slots 16.

A bonnet member 18 is disposed above the upper end of each of the radiating members 17 and is carried on a burner block 19 having a groove 20 extending around one end thereof. The edge of each bonnet member is flanged over to enter the groove 20 of its associated burner block. The burner blocks are laid up in the setting 11 and are composed of refractory material similar to that of which the other bricks are formed.

Each burner block has an opening 21 there-through adapted to receive a burner tube 22. The several burner tubes may conveniently be provided with spark gap igniters 23 and connected through a mixer 24 and a manual control valve 25 to a fuel supply manifold 26.

The construction described herein provides for the supply of a combustible mixture to the burner tubes 22 and upon ignition thereof, hot combustion gases are discharged downwardly through the bonnet members 18 and the radiating members 17. Certain of the notched bricks laid up in tiers to provide the slots 16 have projections 27 extending outwardly therefrom providing baffles insuring intimate contact of the gases with the members 17 for efficient delivery of heat to the latter. The lower ends of the members 17 open into exhaust ducts 28 extending longitudinally of the setting below the pot 10 to a suitable stack. By means of the apparatus described, it is possible to supply heat to the pot 10 with a high degree of efficiency.

The construction of the heat-radiating members 17 is such that the cost thereof is less than that of tubular members, since the refractory brick setting which is employed in any case forms part of the wall for passage of hot gases. A further advantage of the construction shown is that the distance between the inner surface of the wall of the setting and the pot 10 may be made less than the minimum required for tubular heating members.

There is practically no loss in efficiency as com-

pared with the tubular members since the latter radiate heat only to the setting from their sides adjacent thereto.

Although I have illustrated and described herein but a preferred embodiment of the invention, it will be understood that changes in the construction disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

10 I claim:

1. Heating apparatus comprising a refractory wall adjacent a heat-absorbing mass, a trough-shaped, heat-radiating member so mounted on said wall as to define therewith a passage for conveying heating fluid, means for supplying heating fluid to said passage, and projections from said wall extending into said member providing baffles around which said fluid must pass.

2. Apparatus for supplying heat to a heat-absorbing mass comprising a refractory wall adjacent said mass, slots formed in said wall,

trough-shaped metal, radiant members having their edges disposed in said slots to define with said wall a plurality of passages for heating fluid, and means for supplying heating fluid to said passages.

3. Heating apparatus comprising a refractory wall adjacent a heat-absorbing mass, a heat-radiating member of metal plate bent to trough shape and so mounted on said wall as to define therewith a passage for conveying heating fluid, and a burner penetrating said wall for supplying heating fluid to said passage.

4. Apparatus for supplying heat to a heat-absorbing mass comprising a refractory wall adjacent said mass, a plurality of radiant members of metal plate bent to trough shape and mounted on said wall adjacent said mass with their edges embedded in said wall to define therewith a plurality of passages for heating fluid, and burners for supplying heating fluid to said passages.

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