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R. C. DOLL

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ADJUSTABLE FORM FOR REPAIRING REFRACTORY AROUND A TAPHOLE

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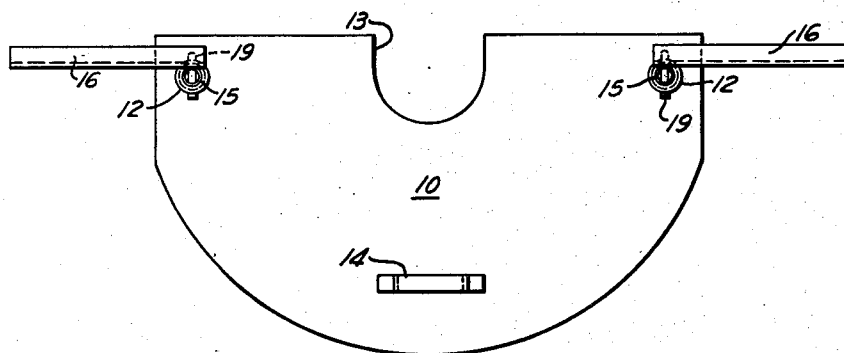


Fig. 1

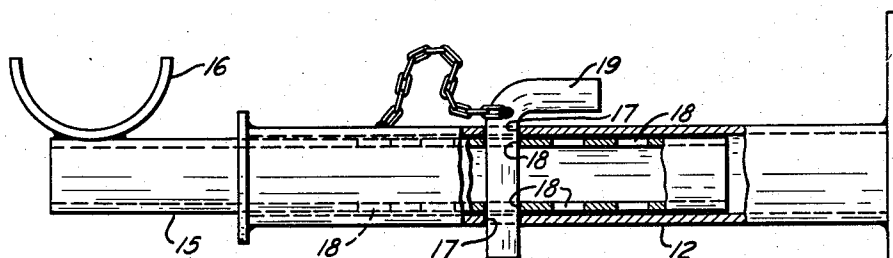


Fig. 2

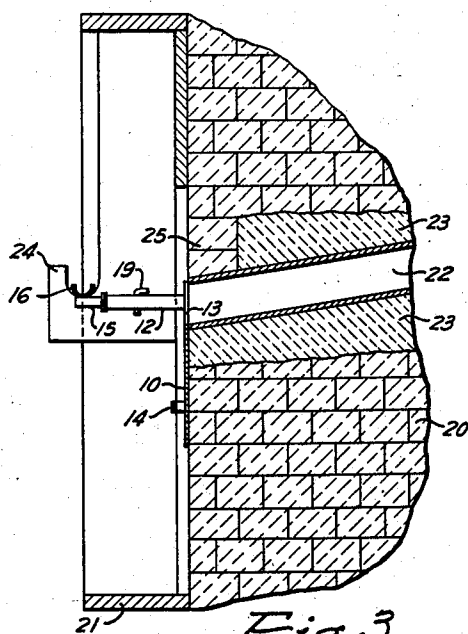


Fig. 3

INVENTOR.

RICHARD C. DOLL

BY *Donald H. Dalton*

HIS ATTORNEY

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ADJUSTABLE FORM FOR REPAIRING REFRAC- TORY AROUND A TAPHOLE

Richard C. Doll, Chicago, Ill., assignor to United States Steel Corporation, a corporation of New Jersey

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3 Claims. (Cl. 266—43)

This invention relates to a form useful in repairing refractory around the taphole of an open hearth furnace.

A conventional open hearth includes a steel plate mounted on the outside of the refractory wall in the vicinity of the taphole. This plate carries a pair of outwardly projecting lugs on opposite sides of the hole for supporting one end of a refractory lined runner trough through which molten steel flows as it is tapped. The taphole is lined with a steel pipe which is embedded in rammed refractory and extends from the furnace chamber to the plate. The rammed refractory is surrounded by the brickwork of the furnace wall. Tapping molten steel erodes the pipe and adjacent refractory, which must be replaced and repaired.

An object of my invention is to provide a form which can be mounted on a taphole plate and serves both to position a pipe within the taphole and to support the refractory as it is rammed into place around the pipe.

A more specific object is to provide a form which includes a plate and adjustable hangers extending therefrom and adapted to rest on the aforementioned lugs and mount said plate against the brickwork below the taphole, where it can serve both to position the pipe within the taphole and to support refractory as it is rammed into place.

In accomplishing these and other objects of the invention, I have provided improved details of structure, a preferred form of which is shown in the accompanying drawing, in which:

Figure 1 is a front elevational view of the form of my invention;

Figure 2 is a side elevation on a larger scale with parts broken away; and

Figure 3 is a fragmentary vertical sectional view on a smaller scale showing the form mounted on a taphole plate.

As shown in Figures 1 and 2, the form includes a flat plate 10 approximately crescent-shaped in outline, and a pair of tubular guides 12 rigidly fixed to said plate and projecting therefrom adjacent its upper corners. The upper edge of the plate contains a notch 13. Preferably a handle 14 is rigidly fixed to the lower portion of the plate. Tubular extensions 15 are telescopically received in the respective guides 12, and each extension carries a hanger 16 rigidly fixed thereto and extending outwardly. The guides 12 have radial openings 17, and the extensions 15 have a series of cooperating radial openings 18 spaced along their length. Lock pins 19 are inserted through the openings 17 and 18 to fix the extensions within the guides in the desired position of adjustment.

Figure 3 illustrates the way the form is used in repairing refractory around an open hearth taphole. The figure shows a portion of an open hearth which includes refractory brickwork 20, a steel taphole plate 21, a taphole pipe 22, and rammed refractory 23 between the brick-

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work and the pipe. The plate 21 carries a pair of spaced lugs 24 which normally support one end of a runner trough, not shown. The open hearth is conventional and hence the showing is confined to the portion needed for an understanding of the present invention.

When the refractory 23 is to be repaired, eroded refractory is cleared away and the form installed with the hangers 16 resting on the lugs 24 and the plate 10 abutting the brickwork 20 below the taphole. Pipe 22 is inserted in the taphole with the notch 13 in the plate serving to position it properly. Bricks 25 are positioned above pipe 22 adjacent the outer end. Refractory material 23 is then rammed into place against the plate 10 and bricks 25. Most of this refractory is inserted through the furnace chamber with a suitable gun as known in the art, but some can be applied from the outside if necessary. Subsequently the form is removed and the pipe plugged in order that the furnace may be placed in operation.

From the foregoing description it is seen that my invention provides a form which facilitates repair of refractory around an open hearth taphole. The form is of simple rugged construction and can be adjusted to fit different open hearths regardless of variations in the distance which their lugs project. The hangers extend outwardly a sufficient distance to engage the lugs despite variations in their spacing.

While I have shown and described only a single embodiment of the invention, it is apparent that modifications may arise. Therefore I do not wish to be limited to the disclosure set forth but only by the scope of the appended claims.

I claim:

1. A form for repairing refractory around an open hearth taphole comprising a plate, a pair of elongated members fixed to one face of said plate and projecting therefrom, and hangers carried by the respective members and extending outwardly sideways therefrom to rest removably on runner lugs of an open hearth taphole plate, said first named plate being adapted to abut the brickwork of an open hearth below the taphole when said hangers rest on said lugs, said first named plate having an opening to position a pipe within the taphole.

2. A form for repairing refractory around an open hearth taphole comprising a plate, a pair of guides fixed to one face of said plate, extensions telescopically engaging the respective guides, and hangers fixed to the respective extensions and extending outwardly to rest on runner lugs of an open hearth taphole plate, said first named plate being adapted to abut the brickwork of an open hearth below the taphole and having a notch in its upper edge to position a pipe within the taphole.

3. A form for repairing refractory around an open hearth taphole comprising a plate, a pair of tubular guides fixed to one face of said plate, extensions telescopically received in the respective guides, locking pins adapted to fix said extensions in said guides in adjusted position, and hangers fixed to the respective extensions and extending outwardly to rest on runner lugs of an open hearth taphole plate, said first named plate being adapted to abut the brickwork of an open hearth below the taphole when said hangers rest on the lugs, said first named plate having a notch in its upper edge to position a pipe within the taphole.

References Cited in the file of this patent

UNITED STATES PATENTS

501,351	Mathewson	July 11, 1893
603,330	Hartman	May 3, 1898