March 29, 1949. F. SOUTH, JR 2,465,822

COVER FOR CRUCIBLE FURNACES

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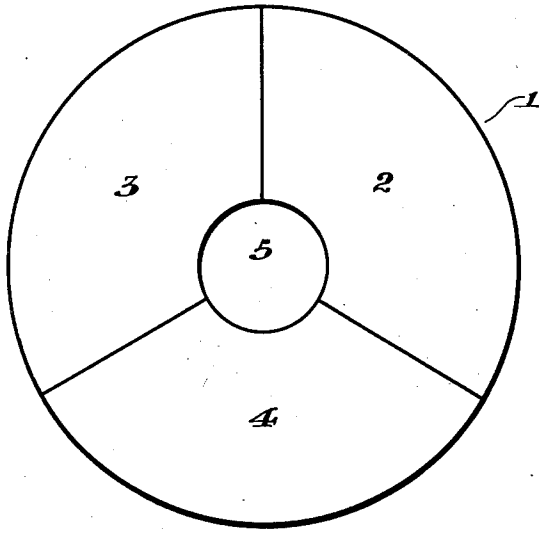


Fig. 1.

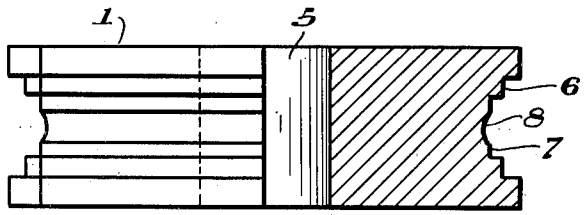


Fig. 2.

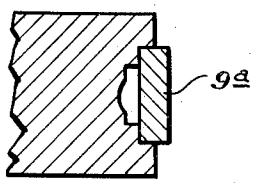


Fig. 3.

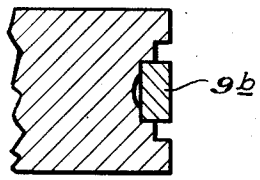


Fig. 4.

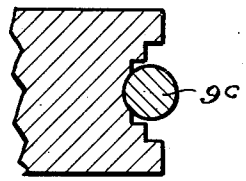


Fig. 5.

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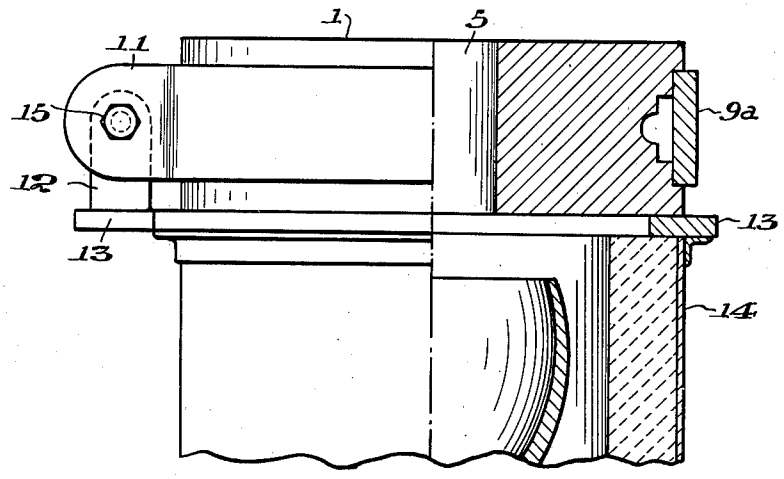


Fig. 6.

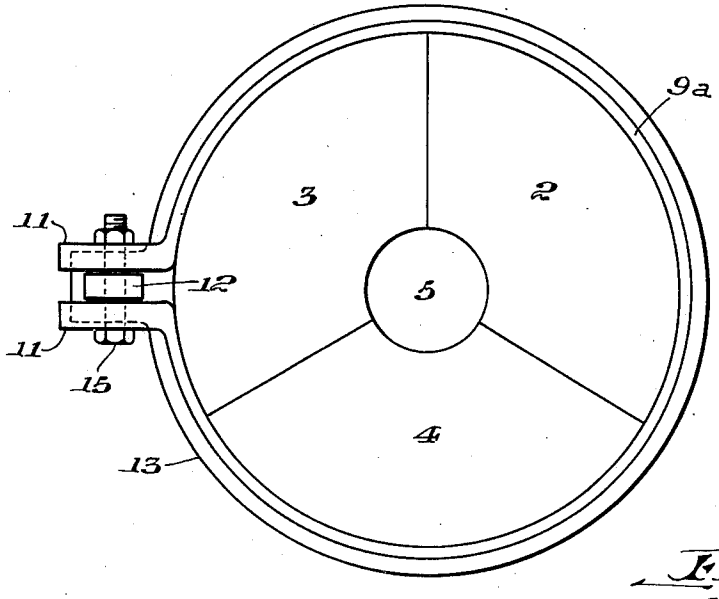


Fig. 7.

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COVER FOR CRUCIBLE FURNACES

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Application October 18, 1947, Serial No. 780,679

5 Claims. (Cl. 263—48)

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This invention relates to covers for crucible and the like furnaces and, more particularly, to covers of refractory material segments that are held together and reinforced by a metal band clamped around their outer edges.

The usual cover for a crucible furnace consists of interfitting segments of refractory material that are held together by a metal reinforcing band clamped around the outer edge of the cover. If the cover is small, it may be made in one piece; and in such cases, a similar band is frequently used to support the cover in conjunction with a hinge or other pivoting means, so that the cover may be easily swung away from the top of the furnace. To assure a firm engagement between either type of cover and the metal band, a common practice is to provide the outer edges of the cover segments (or the outer edge of the cover) with a groove contoured to conform to the size and cross-section of the particular band that is to be clamped around them. Because bands of different sizes and cross-sections are commonly required for covers of the same size, depending on users' preferences, a manufacturer of these covers must stock a number of covers and cover segments that are identical, except for the size and shape of the grooves around their outer edges. This results in considerable expense and inconvenience.

It is among the objects of this invention to provide a cover and individual cover segments for a crucible furnace that are adapted to receive and be firmly engaged by any one of a plurality of metal reinforcing bands of different sizes and cross-sections.

In accordance with my invention, a refractory cover for a crucible furnace is provided with a plurality of grooves around its outer edge. Each groove has a contour of different size and cross-section from the others, and the grooves of smaller cross-section are recessed within those of larger cross-section to form a continuous composite groove. Around such a cover may be clamped any one of several metal bands having a cross-section of the proper size and contour to fit any one of the grooves.

The preferred embodiment of this invention is shown in the accompanying drawings, in which Fig. 1 is a plan view of a circular refractory cover; Fig. 2 is a side elevation thereof, partly in section; Figs. 3, 4, and 5 are fragmentary cross-sections of the cover and various metal reinforcing bands fitted around its outer edge; Fig. 6 is a fragmentary side elevation, partly in section, of an assembled cover and crucible furnace; and Fig. 7 is a plan view thereof.

In the embodiment shown in the drawings, a circular cover 1 of refractory material is composed of interfitting segments 2, 3, and 4, and is provided with a central opening 5 to permit the

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hot gases of combustion to escape from the furnace. Around the outer edge of the cover are three grooves 6, 7, and 8 that are adapted to receive any one of three commonly used forms of metal reinforcing bands. It is a feature of this invention that these grooves are recessed one within the other to form a continuous composite groove, so that the cover need be only slightly thicker than the widest groove. The outer groove 6 has sides of equal depth that are substantially perpendicular to the edge of the cover, and has bottom portions immediately adjacent to the sides that are substantially perpendicular thereto. This groove is adapted to receive a reinforcing band, or strap, having a rectangular cross-section similar to that shown in 9a in Fig. 3. Recessed within groove 6 is a second groove 7 that has a contour or cross-section similar to, but of lesser width than, groove 6. The second groove 7 is adapted to receive a reinforcing band, or strap, having a rectangular cross-section similar to that shown in 9b in Fig. 4. Recessed within groove 7 is a third groove 8 of arcuate contour or cross-section, the chord of which is shorter than the width of groove 7, and it is adapted to receive a reinforcing band having a circular cross-section similar to that shown in 9c in Fig. 5.

It is to be understood that, in accordance with local preferences among users, covers could be provided with more or less grooves or with grooves of different sizes and cross-sections than has been illustrated herein.

One of the ways in which the cover may be attached to a crucible furnace by means of a metal reinforcing band around the cover is illustrated in Fig. 6. The metal band there shown has the same rectangular cross-section as that shown in Fig. 3 and, as in that figure, cooperates with one of the grooves in the outside edge of the cover. Then the ends of the band are turned outwards to form projections 11, adapted to receive between them a tongue 12 projecting from a ring 13 attached to the metal jacket 14 of the furnace. A bolt 15 hingedly connects the projecting ends of the band to the tongue and, at the same time, serves to clamp the band tightly around the cover or cover segments. This arrangement permits the cover to be raised for the insertion or removal of a crucible 16 within the furnace.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A closure for a crucible furnace, comprising

a cover of refractory material having a plurality of grooves recessed in its outer edge, each groove having a different size and cross-section from the others, and the grooves of smaller cross-section being recessed within those of larger cross-section to form a continuous composite groove for receiving any one of a plurality of metal reinforcing bands that has a cross-section of the proper size and shape to fit into one of the grooves.

2. A cover for a crucible furnace, comprising a plurality of interfitting refractory material sections that are segments of a cylinder that has a central vertical opening, a plurality of grooves recessed in the outer circumferential edge of each section, each of said grooves having a different cross-section from the others, and the grooves of smaller cross-section being recessed within those of larger cross-section to form a continuous composite groove around the outer edge of the cover for receiving any one of a plurality of metal reinforcing bands that has a cross-section of the proper size and shape to fit into any one of the grooves.

3. A closure for a crucible furnace, comprising a circular cover of refractory material having recessed in its outer edge a plurality of grooves, including a first groove that has sides of equal depth substantially perpendicular to the edge of the cover and has bottom portions immediately adjacent to the sides substantially perpendicular thereto, a second groove that has a contour similar to but of lesser width than said first groove and that is recessed within said first groove, and a third groove of arcuate contour, the chord of which is shorter than the width of said second groove, and that is recessed within said second groove, to form a continuous composite groove adapted to receive any one of a plurality of metal reinforcing bands having a cross-section of the proper size and shape to fit any one of the grooves.

4. A closure for a crucible furnace, comprising the combination of a circular cover of interfitting sections of refractory material having a plurality of grooves of different cross-section recessed in their outer circumferential edges, the grooves of smaller cross-section being recessed within those of larger cross-section to form a continuous composite groove around the outer edge of the cover, and one of a plurality of metal bands that has a cross-section of the proper size and shape to fit any one of said grooves clamped around the outer edge of the cover to hold its interfitting sections together.

5. In a cover for a crucible furnace, a refractory material section having a peripherally convex edge that is a portion of a cylindrical surface, a plurality of grooves of different size and cross-section recessed in said edge, the grooves of smaller cross-section being recessed within those of larger cross-section, and said section being adapted to be interfitted with other similar sections to form a cylindrical cover having a continuous composite groove around its outer edges for receiving any one of a plurality of metal reinforcing bands that has a cross-section of the proper size and shape to fit into any one of said grooves.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,747,298	Hassel	Feb. 18, 1930
1,846,648	Lobl	Feb. 23, 1932
2,209,081	Rocic	July 23, 1940