

No. 643,060.

Patented Feb. 6. 1900.

A. R. HUGHES.
ANNEALING BOX.

(Application filed May 12, 1899.)

(No Model.)

2 Sheets—Sheet 1.

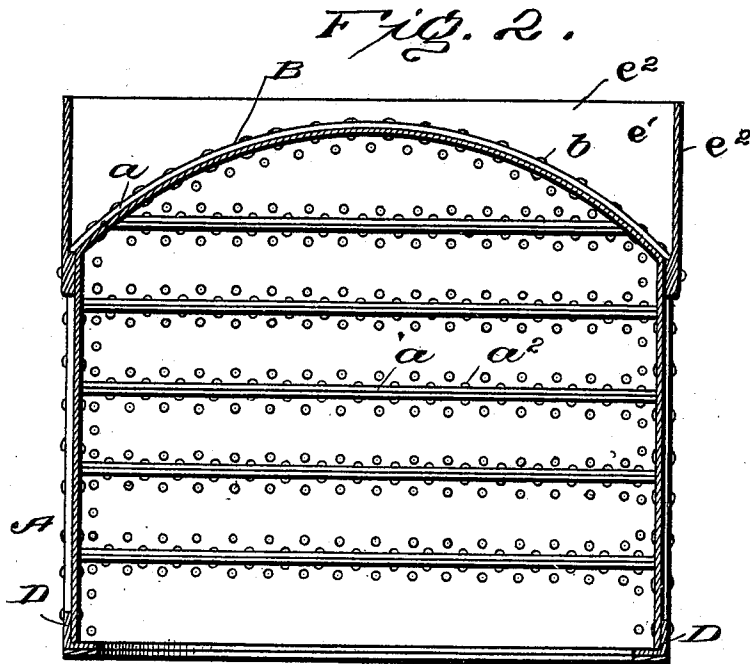
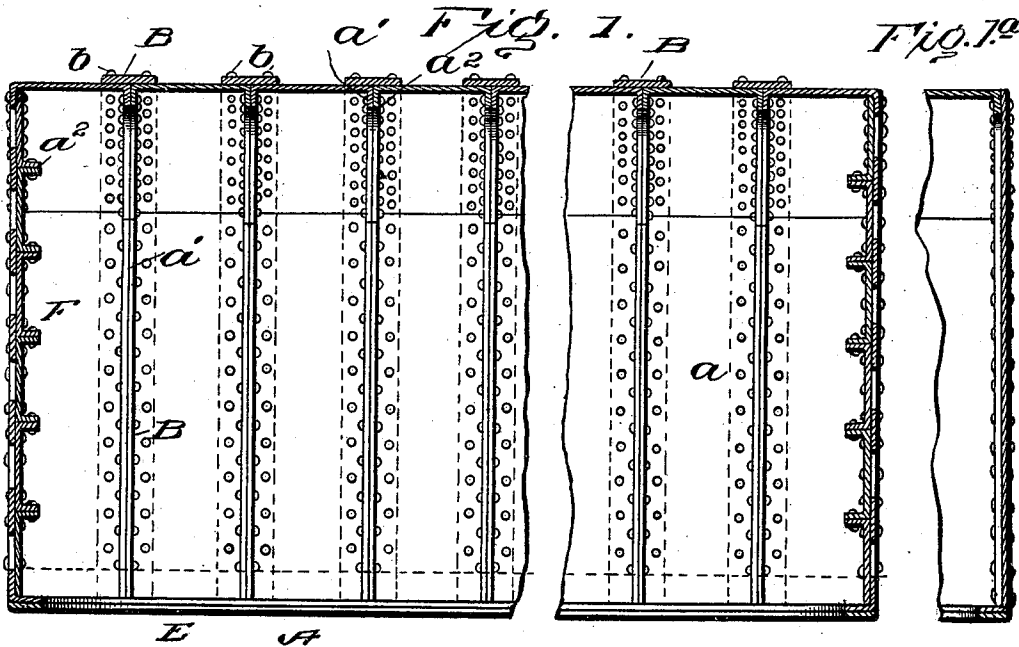


Fig. 7.

Witnesses
John H. Miller
Chas. L. Miller

Fig. 8.

Inventor
Alfred R. Hughes
by *John H. Miller*
Attorney

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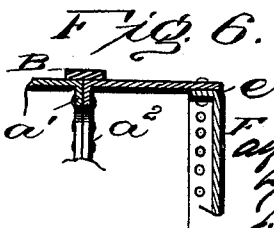
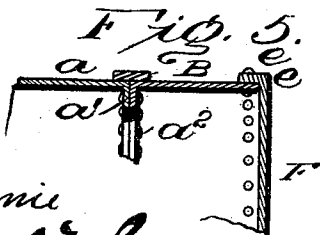
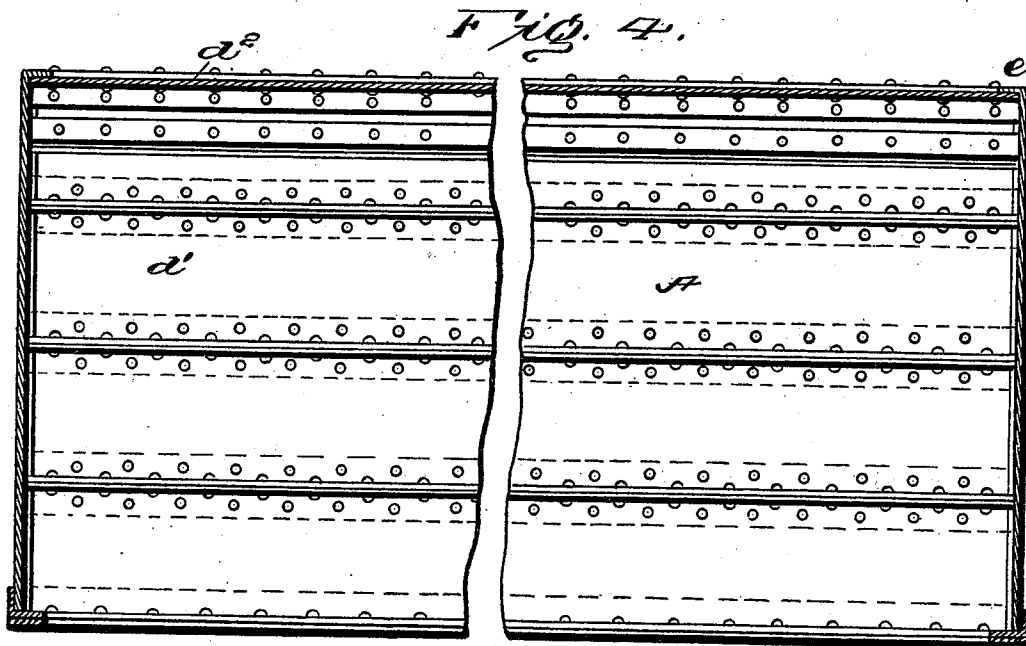
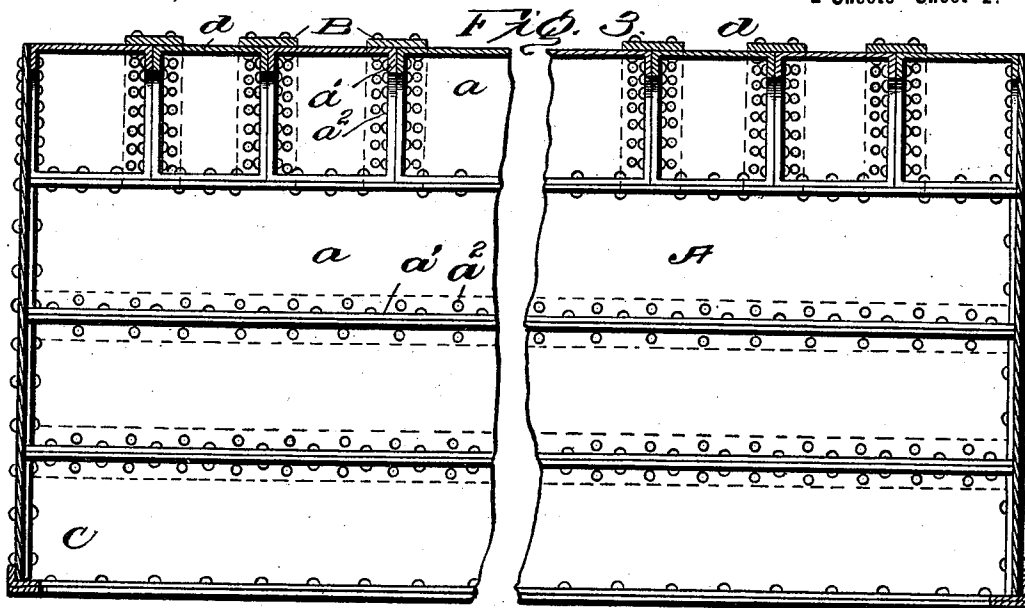
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2 Sheets—Sheet 2.



Witnesses

James M. Miller
Charles L. Miller

Inventor

A. R. Hughes
W. H. Hughes
Attorney.

UNITED STATES PATENT OFFICE.

ALFRED R. HUGHES, OF WARREN, OHIO.

ANNEALING-BOX.

SPECIFICATION forming part of Letters Patent No. 643,060, dated February 6, 1900.

Application filed May 12, 1899. Serial No. 716,549. (No model.)

To all whom it may concern:

Be it known that I, ALFRED R. HUGHES, of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Annealing-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention contemplates certain new and useful improvements in annealing-boxes.

As is well known in the art, annealing-boxes are in practice subjected to extraordinarily high degrees of temperature. In consequence

such boxes soon become warped and before the material of which they are composed is worn out they have to be discarded and new boxes substituted. It has been sought to increase the strength of the boxes by bracing them in various ways, the braces being on the outside or exterior of the boxes. All these attempts, however, to increase the stability and durability of annealing-boxes have proved of but little value, since the exterior bracing is very soon rendered inadequate and is damaged by reason of the intensity of the heat to which the boxes are subjected.

The object of my invention is to brace and strengthen the box throughout its entire structure and at the same time protect all the seams or joints, so that they cannot be burned off or weakened by the intense heat. This I accomplish by making the boxes of channel-bars, the flanges of which are riveted together. Over the seams, between the several bars of which the box is constituted, are placed butt-plates, which are well riveted to the box on both sides of each seam, making all of the latter air-tight. The channel-bars may be differently used—that is, the sides and top may be composed of bars arranged transversely of the length of the box, or the top alone may be so formed, while the sides may have the channel-bars extending longitudinally, or the bars composing both the top and sides may be extended longitudinally. Strengthening-bars may be secured between the riveted flanges. A compartment on the top of the box to hold sand may be obtained by securing a bar or bars along the sides and ends of the box. These bars are composed of wrought metal.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of an annealing-box constructed in accordance with my invention. Fig. 2 is an end view. Fig. 3 shows a slightly-different form of construction with parts broken away, and Fig. 4 is a similar view of a third form of construction. Figs. 5 and 6 are enlarged sectional details, the latter being a slightly-modified form. Figs. 7 and 8 show the use of strengthening-bars.

In carrying out my invention I construct the box A of a series of channel-bars a . The adjacent flanges a' of the several bars are rigidly secured together by rivets a^2 . The strength of the box is enhanced by placing flat bars a^3 between the flanges, such bars being held by the rivets a^2 .

B designates a series of butt-plates which are located over the seams between the flanges of each pair of channel-bars. These plates B are rigidly secured to the box A by two rows of rivets b , passed through the adjacent channel-bars. Preferably the flanges a' are all turned inward, thus requiring the butt-plates to be on the exterior. In this way all of the bracing parts of the box are located on the interior and are protected at their seams by means of the exterior butt-plates. If, however, the flanges be turned outward, the butt-plates are placed on the interior of the box over the several seams.

The preferred form of construction of box A is to have the several channel-bars extended transversely of the box, as shown in Figs. 1 and 2; but these channel-bars may be differently arranged, if so desired. In Fig. 3 I have shown the channel-bars C composing the sides of the box extended longitudinally of the latter, while the bars forming the top d are arranged transversely. In Fig. 4 I have indicated all of the channel-bars composing the sides d' and top d^2 as running longitudinally of the box. In all of these various forms the flanges of the several channel-bars are shown as being turned inward, as previously described, and the seams between such flanges are exteriorly covered by the butt-plates B.

To further add to the strength of the box, I

secure along the lower horizontal edges of the sides angle-irons D, the vertical flanges of which are on the exterior of the box. To the under sides of these angle-irons I secure bars E, which latter, like the angle-irons, are held by rivets. The addition of these strengthening parts, the angle-irons, and the bars secured thereto does not interfere with the bracing-flanges of the channel-bars.

The end sections F of the annealing-box may be of plate metal, as shown in Figs. 3 and 4; but I have shown them in Figs. 1 and 2 as being composed of channel-bars having inwardly-extended flanges, the seams of which are covered by exteriorly - arranged butt-plates. These end sections are secured to the sides and top of the box by end flanges *e*, which are welded and riveted to the top and sides. The flanges may extend over the exterior surface of the box at its ends, as shown in Fig. 5, or they may be secured on the inner sides of the latter, as shown in Fig. 6. The angle-irons and strengthening-bars before described are also provided for the end sections, so as to give to the latter the same strength and rigidity as is possessed by the sides of the box. In Fig. 2 I have shown a sand-compartment *e'* on the top of the box, the same being formed by plates *e''*, attached to the sides and ends and projecting upward a sufficient distance.

In practice the material to be annealed, such as sheet-iron and sheet-steel, is placed on a suitable wrought-iron or cast-iron stand and then inclosed by the box. An air-tight seal is then secured at the bottom edges of the box by means of sand placed around such edges at the sides and ends. The whole is then placed in the annealing-furnace, and after the latter is closed heat is admitted to effect the annealing process.

The advantages of my invention are apparent to those skilled in the art. It will be observed that I have produced a perfectly rigid annealing-box which will retain its original shape, even as against the most intense heat, and can be constantly employed until the material of which it is composed becomes too

thin for further use. The box is composed throughout of wrought-iron, which is of decided advantage over cast-iron, the properties of the former allowing of expansion and contraction without cracking or injuring the box. Boxes composed in whole or in part of cast-iron are liable to be injured by jarring or in striking the floor. The channel-bars, being of wrought-steel, will not break nor be impaired by contraction and expansion, which will be uniform in all parts of the box.

I claim as my invention—

1. An annealing-box having an open bottom and parallel sides and ends and a top connecting said sides and ends, said sides, top and ends being composed of channel-bars, the parallel flanges of which are turned inward and rigidly secured together, and butt-plates on the exterior of the box secured thereto adjacent to the seams between the flanges, substantially as set forth.

2. An annealing-box having an open bottom and parallel sides and ends and a top connecting said sides and ends, said sides, ends, and top being composed of channel-bars arranged transversely of the box, the parallel flanges of the several bars being turned inward and rigidly secured together, and butt-plates on the exterior of the box located over the seams between such flanges, riveted to the adjacent channel-bars, substantially as set forth.

3. An annealing-box having its sides and top composed of channel-bars, the parallel flanges of which are turned inward, flat bars located between such flanges, said flat bars and flanges being rigidly secured together, and butt-plates on the exterior of the box extending over the edges of the flat bars and riveted to the adjacent channel-bars, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALFRED R. HUGHES.

Witnesses:

T. H. GILLMER,
RICHARD GIBSON.