

No. 395,415.

PATENTED AUG. 11, 1908.

W. B. BENNETT.
ANNEALING BOX.

APPLICATION FILED MAR. 6, 1908.

FIG. 1

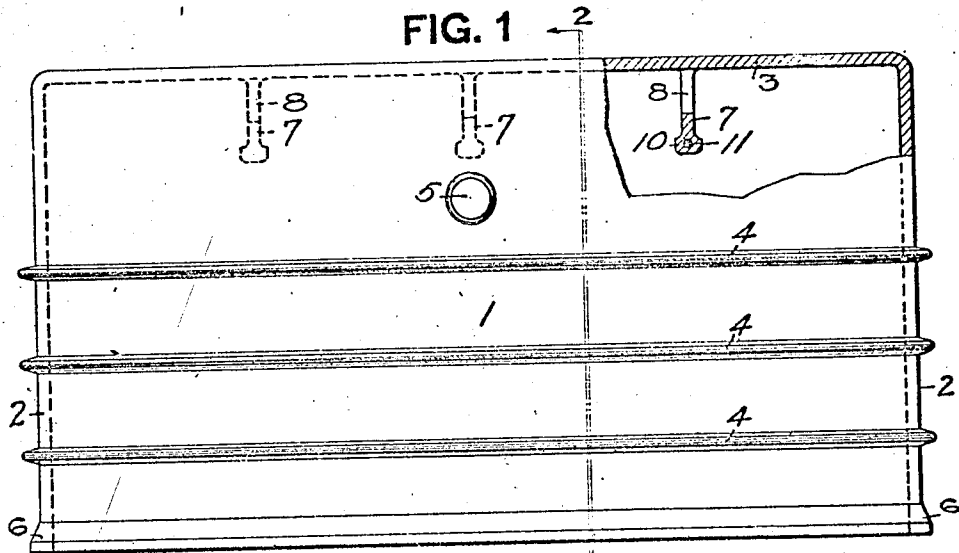


FIG. 2

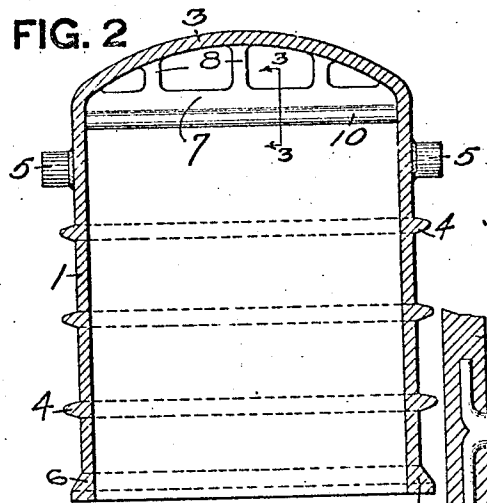


FIG. 3

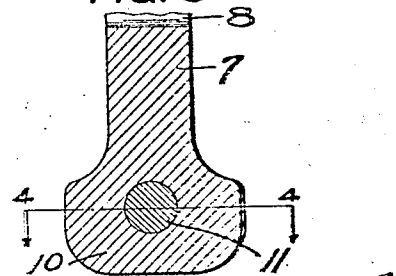


FIG. 5

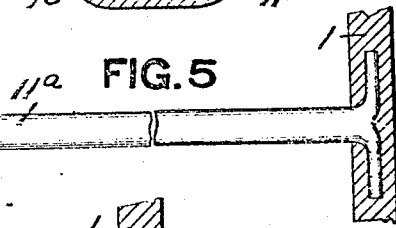
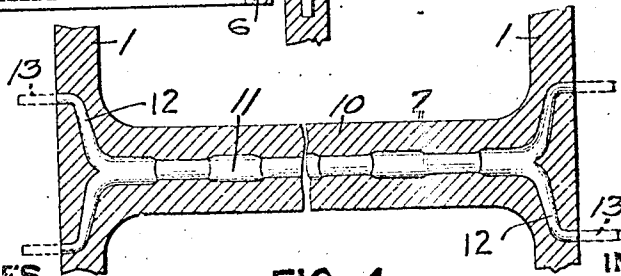


FIG. 4



WITNESSES.

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UNITED STATES PATENT OFFICE.

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ANNEALING-BOX.

No. 895,415.

Specification of Letters Patent.

Patented Aug. 11, 1908.

Application filed March 6, 1908. Serial No. 419,592.

To all whom it may concern:

Be it known that I, WILLIAM B. BENNETT, a resident of Ross township, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Annealing-Boxes; and I do hereby declare the following to be a full, clear, and exact description thereof.

This invention relates to annealing boxes and especially to such boxes formed of cast steel or other cast metal.

The object of the invention is to strengthen such boxes and especially the top portion thereof so as to greatly increase the life thereof.

Annealing boxes are subjected to intense and long continued heat which softens the metal and causes the roof to sag by its weight and push the upper portions of the side walls outwardly. This not only greatly distorts the box, but eventually causes the entire box to collapse. Various attempts have been made to overcome this defect. Patent No. 870,558, granted November 12, 1907, to John B. Henry shows and describes an integral cast annealing box with a truss member connecting the sides near their tops and supporting the roof in order to prevent sagging and distortion of the box. My invention is an improvement upon the box shown in said patent No. 870,558, and consists in the addition thereto of the improvements hereinafter described and claimed.

In the accompanying drawing Figure 1 is a side view, partly in central vertical longitudinal section, of an annealing box embodying my invention; Fig. 2 is a transverse section thereof on the line 2—2, Fig. 1; Fig. 3 is a cross section on an enlarged scale through the tie member or chord of the truss on the line 3—3, Fig. 2; Fig. 4 is a detail horizontal section on the line 4—4, Fig. 3 on an enlarged scale; and Fig. 5 is a horizontal sectional view showing a modification.

The annealing box shown in the drawing is provided with the usual side walls 1, end walls 2 and arched roof 3, these parts being formed as a single integral casting and the side and end walls being stiffened or strengthened by horizontal ribs 4, all as is usual in this type of box. The usual trunnions 5 are provided for lifting the box. The side and end walls at their bottoms are also flanged or

thickened, as at 6, in order to stiffen the same. Connecting the side walls near their tops, and substantially at the point where the arched roof springs from said side walls, is a transverse tie member or members 7, the drawings showing three such members in the box illustrated, but the number will vary according to the length of the box. These tie members are cast integral with the box and are connected to the roof by one or more struts or supports 8, although if desired, a web may take the place of the struts. For the sake of lightness, however, the struts are preferred and in effect form an open web.

The tie members 7 are in effect tension chords of trusses, whose top chords are the roof 3 and whose struts are the parts 8. The chords 7 act as tension members to prevent the side walls of the box bulging out due to the outward thrust of the sagging roof. Consequently the distortion of the box is almost entirely prevented.

The box so far described is substantially the same as that illustrated and described in the patent No. 870,558 above referred to. I have added several improvements thereto.

One improvement consists in providing the chord 7 on its lower edge with a bulb or thickened portion 10 so as to give additional strength to this part and prevent the formation of checks and cracks in the cooling of the metal after casting. The bulbs 10 are formed in casting the box by merely modifying the shape of the pattern. They provide sufficient metal at the lower edges of the chord 7 so that in cooling after casting shrinkage checks or cracks are not likely to occur, the bulk of metal being sufficient to hold the heat sufficiently long to prevent this.

Another improvement consists in providing a transverse reinforcement member formed of wrought metal, such as wrought iron or steel, and having its ends extending into and embedded in the side walls. Figs. 1 to 4 show this reinforcement member as a wrought metal bar 11 embedded and enveloped in the lower edge of the chord 7, and having its ends formed with anchoring means embedded in the side walls. As shown in these views the ends of the bar are split and forked outwardly, as at 12, to provide the anchors. This bar will be placed in the mold prior to pouring, the extreme end por-

tions of the parts 12 being extended, as at 13, to form supports for holding it in position in the mold. The metal is then poured and cast around such reinforcing bar, after which the end portions 13 are cut off flush with the outer face of the box. This bar 11 may be of round or any suitable cross section and may, if desired, be of irregular contour from end to end, such as using an ordinary twisted or square bar, or deforming the same in any of the well known ways. Fig. 4 shows a well known form of deformed bar. This gives a strong grip or attachment of the cast metal on the same. This reinforcing bar is of metal of different character from the metal constituting the chord of the truss and has a slightly different coefficient of expansion. It also is a fibrous metal so that any cracks which may be developed in the cast chord in the cooling of the box, or in its use, will stop when they reach such reinforcement bar. Being formed of a metal of a different coefficient of expansion, it also neutralizes to some extent the expansion and contraction and to that extent assists in preventing distortion of the box.

Fig. 5 shows a modification in which the transverse reinforcing bar 11^a is used without a cast chord 7 and struts 8. In this case the bar may be of regular cross section but provided at its ends with suitable anchoring means, such as slitting the same and turning its ends outwardly, as shown. The ends of the bar do not extend out through the side walls but the bar is supported in a suitable opening provided in the center core so that the metal, when poured in the mold, envelops and embeds the ends of said bar. The bar thereby becomes strongly anchored in the side walls, but in a manner so that openings cannot be formed through the outer face for the admission of air. The bar in this case serves as a transverse tie member to tie together the side walls at their tops.

The box described is simple of construction, as it is practically a single integral casting and can be cast in a mold with very little additional coring over the method followed in the manufacture of prior boxes. The top is so strengthened that distortion of the parts is practically overcome and consequently the life of the box is very great.

While the box is shown as provided with a symmetrical arched roof, I wish it understood that the invention applies equally as well to a box with a roof higher at its center than at its sides, such as a hip roof, or to a flat roofed box, or to a roof composed of one or more domes, or of any other desired design, with substantially equally beneficial results.

What I claim is:

1. An annealing box having side and end walls and roof, and a transverse tie member connecting the sides at the juncture of the

roof and side walls, said tie member having a bulbous lower edge, all said parts being a single integral casting.

2. An annealing box having side and end walls and roof, and a truss member connecting the sides at the juncture of the roof and side walls and supporting the roof, said truss member having a bulbous lower edge, all said parts being a single integral casting.

3. An annealing box having side and end walls and roof, a chord extending between the sides at the juncture of the roof and side walls, said chord having a bulbous lower edge, and struts extending from said chord to the roof, all said parts being a single integral casting.

4. An annealing box having side and end walls and roof, a transverse tie member connecting the sides at the juncture of the roof and side walls, all said parts being a single integral casting, said tie member having embedded therein a wrought metal reinforcing bar extending into the side walls.

5. An annealing box having side and end walls and roof, and a truss member connecting the sides at the juncture of the roof and side walls and supporting the roof, all said parts being a single integral casting, and a wrought metal reinforcing bar embedded in said truss and extending into the side walls.

6. An annealing box comprising side and end walls and a roof, a chord extending between the sides at the juncture of the roof and side walls, struts extending from said chord to the roof, all said parts being a single integral casting, and a wrought metal reinforcing bar embedded in said chord.

7. An annealing box having side and end walls and roof, a transverse tie member connecting the sides at the juncture of the roof and side walls, all said parts being a single integral casting, and a wrought metal reinforcing bar embedded in said tie member and extending into the side walls and provided with anchoring means embedded in said side walls.

8. An annealing box having side and end walls and a roof, a transverse tie member connecting the sides at the juncture of the roof and side walls and provided with a thickened portion, all said parts being a single integral casting, and a wrought metal reinforcing bar embedded in the thickened portion of said tie member.

9. An annealing box having side and end walls and a roof, a transverse chord extending between the sides at the juncture of the roof and side walls and having a thickened lower edge, struts extending from said chord to the roof, all said parts being a single integral casting, and a wrought metal reinforcing bar embedded in the thickened portion of the chord and having its ends provided with anchoring means embedded in the side walls.

10. An annealing box having side and end walls and roof formed in a single integral casting, and a transverse tie bar connecting the sides at the juncture of the roof and side walls, the sides being cast around the ends of said tie bar.

the sides and having anchoring means at its ends, the metal of the sides being cast around said anchoring means.

In testimony whereof, I the said WILLIAM B. BENNETT have hereunto set my hand.
WILLIAM B. BENNETT.

Witnesses:

ROBERT C. TOTTEY,
J. R. KELLER.

11. An annealing box having side and end walls and a roof formed in a single integral casting, and a transverse tie bar connecting