L. C. STEELE.

ANNEALING BOX.

APPLICATION FILED FEB. 26, 1913.

1,068,709.

Patented July 29, 1913.

FIG. 1

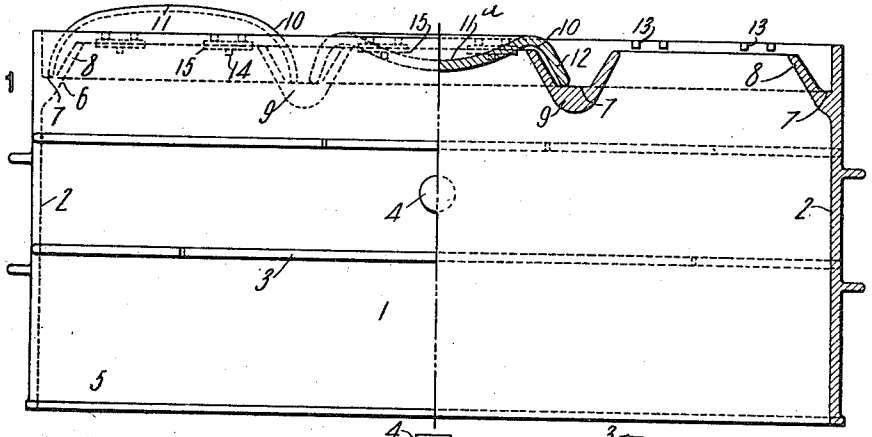


FIG. 2

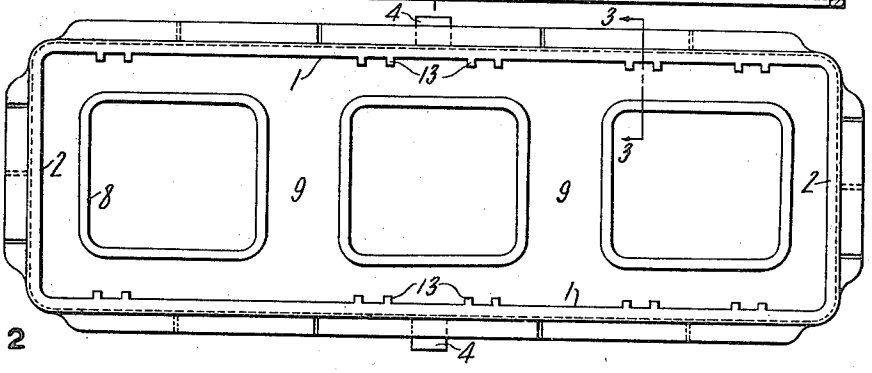


FIG. 4

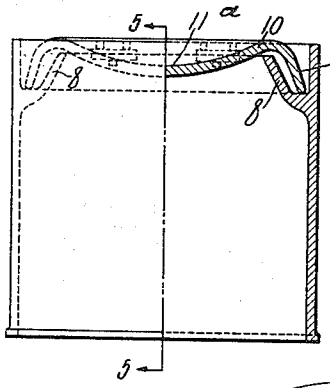


FIG. 5

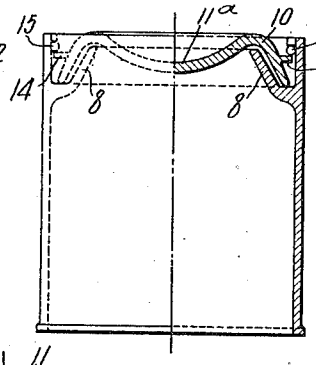
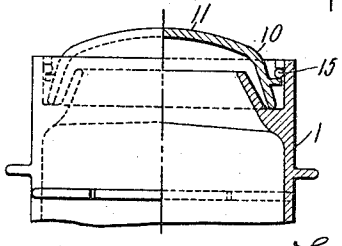


FIG. 3



WITNESSES

U. T. Hohman

Elbert L. Hyde

INVENTOR

Laurence C. Steele,

By Fredk W. Wenzel.

Attorney.

UNITED STATES PATENT OFFICE.

LAWRENCE CARR STEELE, OF PITTSBURGH, PENNSYLVANIA.

ANNEALING-BOX.

1,068,709. Specification of Letters Patent. Patented July 29, 1913.

Application filed February 26, 1913. Serial No. 750,771.

To all whom it may concern:

Be it known that I, LAWRENCE CARR STEELE, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Annealing-Boxes, of which the following is a specification.

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

The object of the invention is to provide an improved annealing box having a roof or cover detachably secured thereto so that distortion or change of shape of the roof will not tend to set up internal strains or stresses in or communicate the same to the side or end walls of the box, such as might result in fracture thereof.

A further object of the invention is to reinforce and stiffen such boxes so as to greatly prolong the life thereof and to also provide a box wherein the separable roof or cover when distorted may be readily taken off and reshaped, or discarded and replaced by a new one.

Annealing boxes are subjected in use to intense and long continued heat, which softens the metal and causes the roof of the box to sag, thereby thrusting the side walls outwardly and collapsing the box. The heat and sagging also sets up internal strains and stresses in the metal which usually result in the formation of cracks or fractures in the edges joining the roof and side or end walls.

My invention is particularly designed to increase the life of the box by providing it with a separable roof which will not transmit strains or stresses to the side or end walls and which is so arranged as to have a certain amount of movement with respect to those walls, whereby sagging of the roof may occur without bulging the walls outwardly, and which roof may be readily removed and reshaped, or if so distorted as to be useless may be readily replaced.

In the drawings Figure 1 represents a view, partly in side elevation and partly in section, of an annealing box embodying my invention; Fig. 2 is a plan view thereof, the roof covers being omitted; Fig. 3 is a view, partly in end elevation and partly in section, on the line 3—3, Fig. 2, looking in the direction of the arrows; Fig. 4 is a view corresponding to Fig. 1, of another annealing box embodying my invention; and Fig. 5 is a sectional elevation thereof on the line 5—5, Fig. 4.

The annealing box shown in the drawings is provided with the usual side walls 1 and end walls 2, these walls being stiffened or strengthened by horizontal ribs 3, all as is usual in this type of box. All of these parts are formed as a single integral casting of steel or other suitable metal. The usual trunnions 4 are provided for lifting the box. The side and end walls at their bottoms are also flanged or thickened, as at 5, in order to stiffen and strengthen the same. Near their tops or upper edges the side and end walls 1 and 2 are provided with channel members 6, formed integral therewith and preferably on the inner surfaces of the walls. These channel members are concaved upwardly and have flat bottom floors 7 and upwardly extending flanges 8. They extend continuously from end to end of the box along both side walls and from side to side of the box along both end walls and considerably stiffen and strengthen the same along their upper edges. The particular channel shape of these members also prevents to a large degree bulging and distortion of the side and end walls by the side thrust of the roof members under the intense heat encountered in service. The box may also be provided with one or more transverse channel members 9, two being illustrated in the form shown in Figs. 1 and 2. These channel members are shaped to correspond with the side and end channels 8, are continuous therewith, and are provided with similar flat bottom floors 7. They form tie members or trusses between the side walls of the box and act in tension to prevent bulging, due to the outward thrust of the sagging roof, and in compression to prevent inward collapse.

The roof of the box consists of one or more covers or members 10, of the form shown in Fig. 4. These roofs are substantially rectangular in plan view and are dish-shaped, having arched central body portions and downwardly extending outwardly flared peripheral flanges or edge portions 12. The body portions may be arched upwardly, as shown at 11 in Figs. 1 and 3, or may be arched downwardly, as shown at 11^a in Figs. 1 and 5. The covers 10 are preferably made slightly narrower than the distance across the box and are placed in position with their edge portions or flanges 12 pro-

jecting down into the channels 8 and 9 and resting on and supported by the flat bottom floors 7 thereof. As the covers 10 are narrower than the box, the edge portions 12 thereof slide outwardly on the floors 7 as the covers sag under the intense heat. For this reason the covers may sag considerably before any strain is placed upon the side or end walls by the outward thrust due to the sagging cover.

The boxes can be made of any size or shape. The box illustrated in Figs. 5 and 6 is of substantially the same dimensions in both directions horizontally and it is provided merely with channels 8 along its side and end walls and with a single cover or roof 10. In case the particular objects to be annealed are of such shape as require the box to be longer in one direction than in the other, it is made of the form shown in Figs. 1 and 2. In this case the transverse struts or channels 9 are provided, and a plurality of the covers or roofs 10 are used.

Preferably, and as shown, the side walls 1 of the box are provided just above the channels 8 with pairs of lugs or projections 13 spaced horizontally from each other. The covers are also provided with side projections 14. These projections are so located upon the covers that when the latter are applied to the box, as shown in Figs. 1 and 3, the projections 14 are slightly below the projections 13 on the side walls. Pins 15 are then thrust in place between the projections 13 and 14 to lock the covers in place and prevent them from accidentally escaping in handling the box.

The annealing box described has a much longer life than boxes as heretofore constructed. The covers are of a form which may be easily and cheaply cast and sagging thereof will merely cause the edge flanges of the covers to slide outwardly in the channels 8 and 9, without exerting any outward thrust such as might bulge the side or end walls of the box outwardly. More important, however, is the fact that the roof or cover of the box is formed of a member or members separate from the side and end walls. For this reason distortion or change of shape of the roof does not affect the shape of the body of the box and does not set up internal strains or stresses in the metal thereof. When annealing boxes are made of a single integral casting as is usual, any change in shape of the cover or roof exerts a direct strain upon the side and end walls and usually causes cracks or fractures along the edge joining the roof and side and end walls of the box. This is wholly avoided by my invention. Moreover, the channels 8 and the tie channels 9 materially strengthen the side walls and tend to prevent bulging of the box in case the cover does collapse so far as to exert a thrust upon the side walls. Whenever the covers sag so far as to exert an outward thrust upon the walls of the box they may be removed and hammered back into shape by an ordinary forging or hammering operation, but if so far distorted as to be practically useless may be discarded and replaced by new covers at much less expense than the cost of providing an entirely new box. The box may be readily made air-tight by luting the edges of the covers with sand in the usual manner.

What I claim is:—

1. An annealing box, comprising side and end walls integral with each other and having integral channel members near their upper edges concaved upwardly, a channel member extending across between the side walls of said box and integral therewith, and a plurality of covers for said box having edge portions resting in said channels, said cross channel supporting the edges of both covers.

2. An annealing box, comprising side and end walls integral with each other and provided with integral channel members near their upper edges, the side walls of said box being longer than the end walls, a plurality of channel members extending across between the side walls of said box and integral therewith, and a plurality of dish-shaped covers for said box, said covers being concaved downwardly and arranged with their edge portions resting in said channels, said cross channels each supporting the adjoining edges of a pair of said covers.

3. An annealing box, comprising side and end walls integral with each other and having channel members near their upper edges, a cover having its edge portions resting in and supported by said channels, side projections on said cover, coöperating projections on said side and end walls, and members adapted to be inserted between the cooperating projections on the cover and walls for locking the cover in place.

In testimony whereof, I have hereunto set my hand.

LAWRENCE CARR STEELE.

Witnesses:

ELBERT L. HYDE,

WILLIAM B. WHARTON.