June 27, 1939. K. J. DEAHL 2,163,937

ANNEALING BOX

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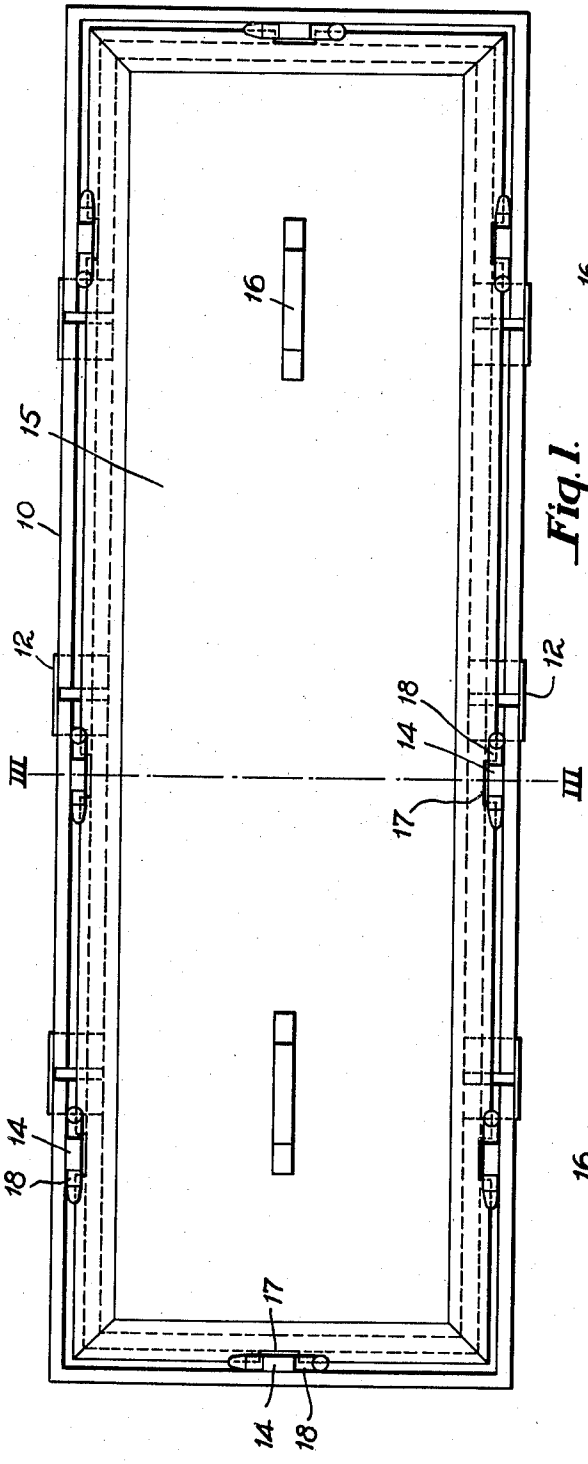


Fig. 1.

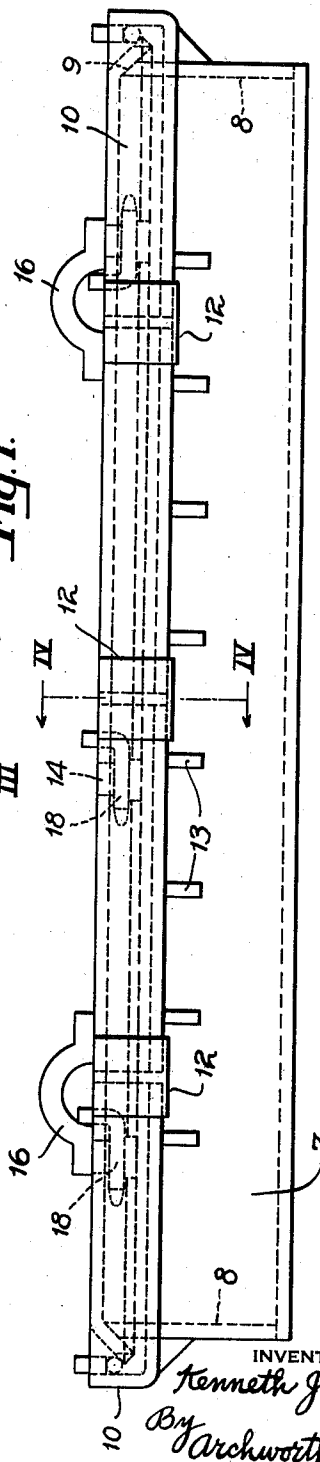


Fig. 2.

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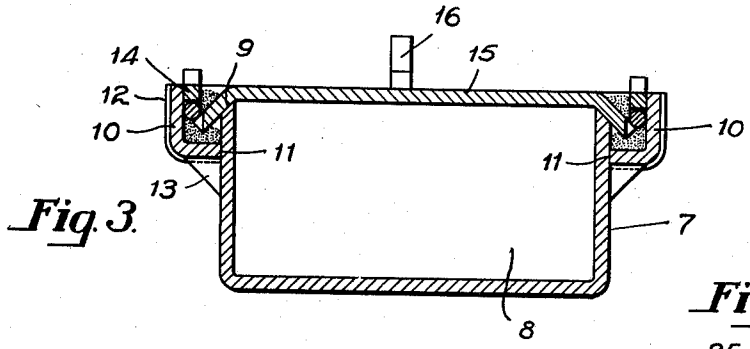


Fig. 3.

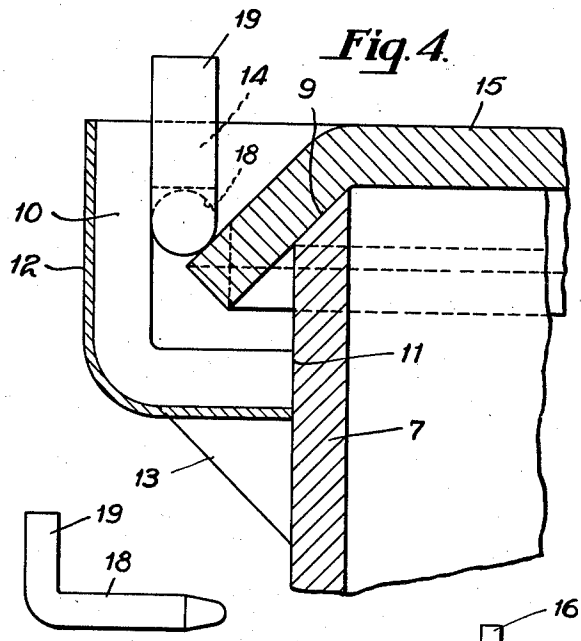


Fig. 4.

Fig. 6.

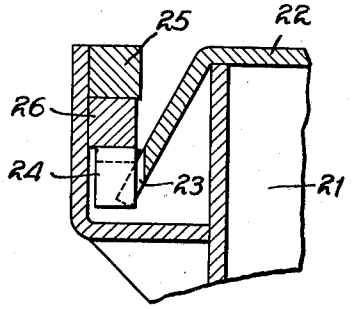


Fig. 7.

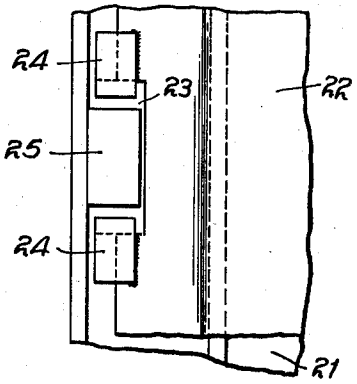


Fig. 8.

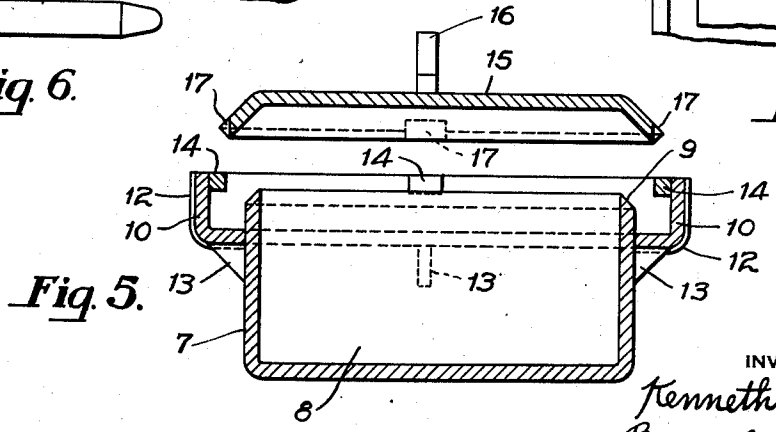


Fig. 5.

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UNITED STATES PATENT OFFICE

2,163,937

ANNEALING BOX

Kenneth J. Deahl, Pittsburgh, Pa., assignor to Pittsburgh Annealing Box Company, Pittsburgh, Pa., a corporation of Pennsylvania

Application August 14, 1937, Serial No. 159,079

2 Claims. (Cl. 263—49)

My invention relates more particularly to annealing boxes of the pan type, having bottom and side walls and provided with removable covers, although certain features of the invention are capable of use in connection with annealing boxes of other forms.

One object of my invention is to provide an annealing box of the pan type having a cover, with means for firmly holding the cover in place and also serving to prevent spreading of the sides relative to the cover when said sides become heated.

Another object of my invention is to provide an improved sand seal for the edges of annealing box covers of the type referred to.

Still another object of my invention is to provide an improved means for resisting distortion of an annealing box under temperature changes.

As shown in the accompanying drawings, Figure 1 is a plan view of the annealing box; Fig. 2 is a side elevation thereof; Fig. 3 is a view taken on the line III—III of Fig. 1; Fig. 4 is an enlarged view taken on the line IV—IV of Fig. 2; Fig. 5 is a view similar to Fig. 3, but showing the box cover in raised position; Fig. 6 is a view showing one of the key or locking members for holding the cover; Fig. 7 is a view similar to Fig. 4, but showing a modified structure, and Fig. 8 is a fragmentary plan view thereof.

The box comprises a pan or body portion 7 whose bottom and sides may be formed of a rolled plate bent to channel form, end plates 8 being set into the channel adjacent to its ends and welded to the bottom and sides of such channel. In making the box, I prefer to use rolled metal. The upper edges of the side and end walls of the box are beveled, as indicated at 9.

A sand trough 10 is provided peripherally of the box adjacent to the upper edge thereof, the trough 10 being formed of a series of relatively short angles welded at 11 to the sides and ends of the box. The trough is made in short sections so as to permit more freedom of expansion and contraction under temperature changes. At the meeting ends of the sand trough sections lap plates 12 of channel form are provided, each of these plates being welded to the box side and one of the trough sections and overlapping the spaces between the sections, so as to prevent loss of sand. Gusset plates 13 are welded to the box sides and to the bottoms of the trough sections at suitable intervals, to stiffen and support the trough. Stop shoulders or lugs 14 are welded at various points to the sand trough, for a purpose to be hereinafter described.

A cover 15 for the box is provided with loops or eyes 16 welded thereto for the reception of crane hooks that are employed in lifting the cover. The cover 15 along its longitudinal edge and end portions is bent downwardly into angular coincidence with the beveled edge 9 of the box, so as to have close fit therewith when the cover is seated on said edges. The bent-down edges of the cover are cut away at certain points, as indicated at 17, for a width slightly greater than the width of the stop shoulders 14, to permit entry of said down-turned edges into the sand trough.

After the cover 15 has been lowered into position upon the box, keys 18 are inserted between the shoulders 14 and the adjacent edges of the cover, such keys being provided with up-turned striking portions 19 whereby they may be conveniently driven into and out of locking position. The sand trough will, of course, be filled with sand to effect a proper seal between the cover and the box.

Tendency of the box sides to become distorted or expanded when being heated, is resisted by the interlocking engagement between the cover and the box. For example, when the sides tend to bulge out, the force is transmitted through the beveled edges at 9 to the cover, with consequent tendency to lift the cover. However, lifting of the cover is prevented by the keys 18, which bear against the stop shoulders 14 and the sides of the sand trough 10. The cover is thus held against being raised and the side walls held against bulging or spreading.

Placing the holding members for the cover within the sand trough conserves space as compared to structures where hooks or clamps are used for holding the lid in place and which would extend beyond the outer faces of the sand troughs. Also, screws and bolts are unsatisfactory because of corrosion and difficulty of removal.

It will be understood that the invention is not limited to annealing boxes which are open only at their upper sides, but the removable cover applied as herein disclosed would be of advantage in annealing boxes which are open at their lower sides and whose lower edges are sealed by sand troughs. In many cases the tops of annealing boxes fail before the sides thereof, and it would be advantageous, of course, to provide separately formed tops or covers for such annealing boxes which can be readily replaced and

which will, nevertheless, serve to resist outward spreading or bulging of the box sides.

In Figs. 7 and 8, I show an arrangement which is intended for use with covers of lighter gauge metal, wherein there may not be sufficient stiffness in the down-turned edges to resist outward bending of the box sides. In this case, the box 21 is provided with a cover 22 whose down-turned edges are cut away at various points, as indicated at 23. A pair of L-shaped stop members 24 are inserted into each cut-away space 23, and welded to the cover at the ends of said cut-away spaces. The stop members serve in effect as hooks, so that the cover will be held firmly in place. Also, they reinforce the edges of the cover and, being inset somewhat from the edge of the cover, serve to provide greater resistance to bending of the cover than if a key were simply inserted at approximately the lower-most edge of the cover.

The cut-out spaces 23 are of sufficient length that each pair of stop members 24 will be sufficiently far apart to permit movement of such stop members past stop shoulders 25 which are welded to the sand trough. Removable keys 26 are inserted between the stop members 24 and the stop shoulder 25. The keys are preferably of rectangular form in cross section, but could be of round or some other shape if desired.

I claim as my invention:

1. The combination with an annealing box open at its upper side, of a sand trough disposed exteriorly of the box and provided with inwardly-projecting stop shoulders, a cover adapted to rest upon the box and having edge portions thereof inclined downwardly into the trough, below said shoulders and engaging the edges of the box, and locking keys interposed between said stop shoulders and the upper surface of said inclined edge portions of the cover, parts of the inclined portions being cut away at the said shoulders to permit vertical placement of the cover.

2. The combination with an annealing box open at its upper side and having its upper edges beveled, of a sand trough disposed exteriorly of the box and provided with inwardly-projecting stop shoulders, a cover adapted to rest upon the box and having edge portions thereof inclined downwardly into the trough, below said shoulders and resting upon the said beveled edges of the box, and locking keys interposed between said stop shoulders and the upper surface of said inclined edge portions of the cover, parts of the inclined portions being cut away at the said shoulders to permit vertical placement of the cover.

KENNETH J. DEAHL.