

Aug. 13, 1946.

C. W. ATTWOOD

2,405,631

DRYING OVEN

Filed Aug. 27, 1943

2 Sheets-Sheet 2

FIG. 3.

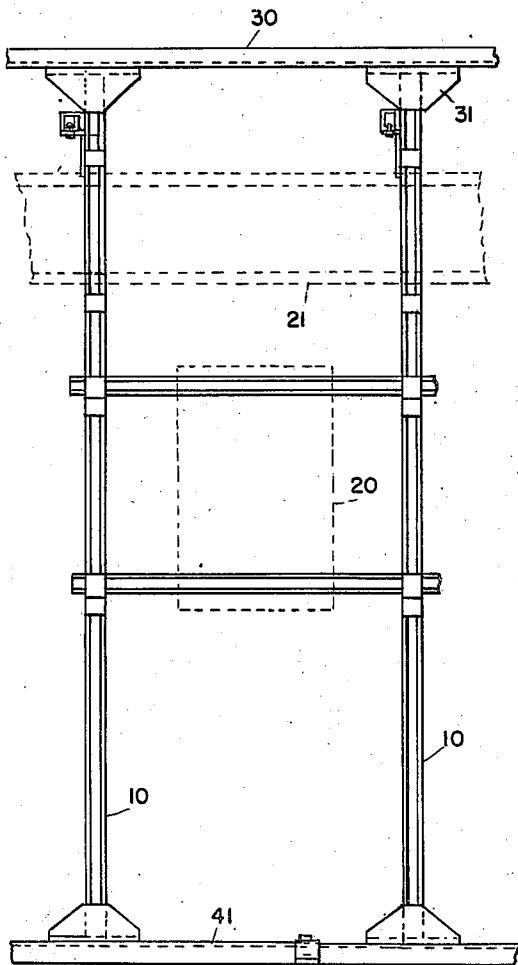


FIG. 4.

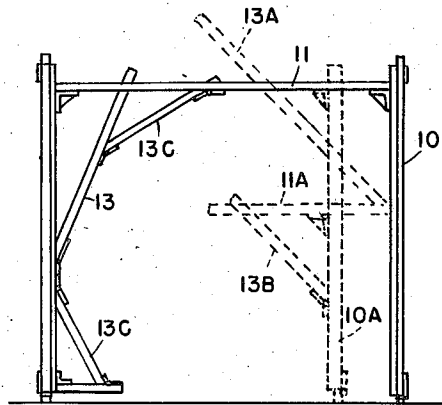


FIG. 5.

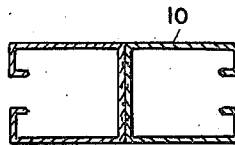


FIG. 6.

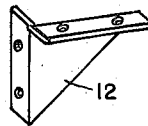
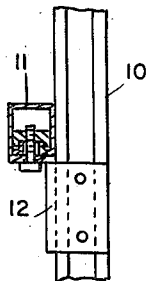


FIG. 7.



INVENTOR.

CHARLES W. ATTWOOD

BY *Swan, Frye & Hardesty*

ATTORNEYS

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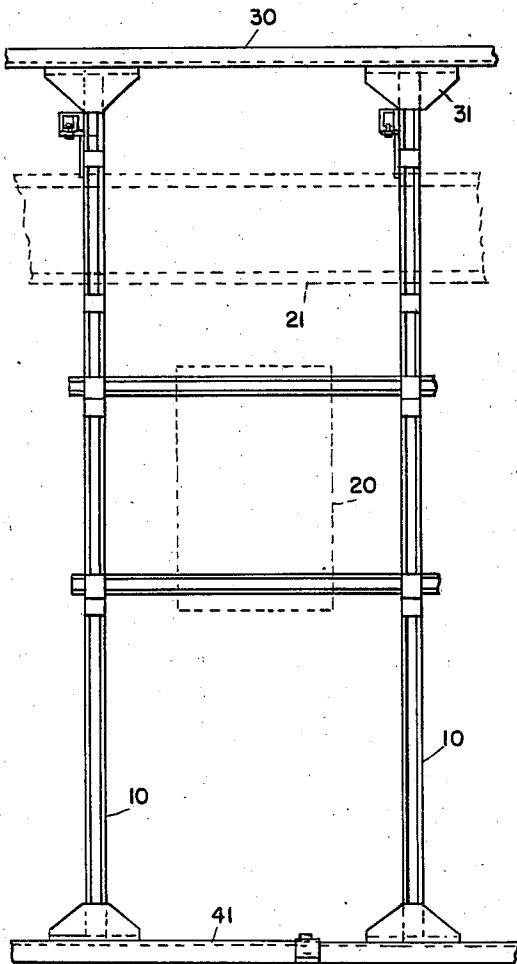


FIG. 4.

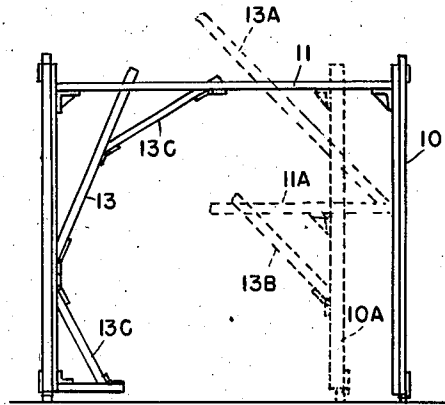


FIG. 5.

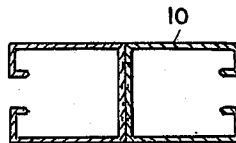


FIG. 6.

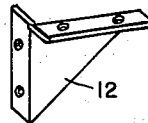
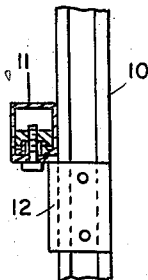


FIG. 7.



INVENTOR.

CHARLES W. ATTWOOD

BY *Swan, Faye & Hardesty*

ATTORNEYS

UNITED STATES PATENT OFFICE

2,405,631

DRYING OVEN

Charles W. Attwood, Wayne, Mich.

Application August 27, 1943, Serial No. 500,228

5 Claims. (Cl. 219-34)

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The present invention relates to oven structures for use in the drying of painted articles by means of light and heat rays, direct and reflected, from infra-red producing lamps.

Ovens for this purpose have been in use for a considerable period and usually consist of frames of welded or bolted angle or channel members carrying suitable lights arranged so as to conform to the shape of the article and be as near the latter as possible.

Such ovens do not readily lend themselves to changes when it is desired to use them for articles of a different size and shape and therefore have to be completely dismantled and rebuilt or else scrapped or set aside.

Among the objects of the present invention is oven structure which provides for easily and quickly changing its size and light location so as to adapt it for drying of articles either larger or smaller than that for which the oven was originally set up and also provides for quickly and easily relocating the light so as to conform to the new article.

Another object is oven structure which lends itself to the use of either overhead or floor mounted conveyor tracks or rails.

Other objects and advantages will be apparent to those skilled in the art upon reference to the following description and the accompanying drawings in which

Figure 1 is an end elevation of a port of an oven frame section, it being understood that the oven consists of as many frame sections as may be necessary to provide the required oven length.

Figure 2 is a similar view of another port of a frame section.

Figure 3 is a side elevation of a portion of an oven.

Figure 4 is a view in elevation of a frame section indicating some of the changes possible.

Figure 5 is a section on line 5-5 of Figure 2.

Figure 6 is a perspective view of one of the brackets.

Figure 7 is an enlarged view showing the attachment of a cross member.

In the drawings, the oven structure is indicated as comprising a plurality of substantially identical frames arranged to form a tunnel and fixed together by longitudinal members. The number of frames and their spacing will be determined by the length of oven and the number of lights required.

Each of the frames is constructed as indicated in Figures 1 and 2 which show respectively the

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left and right sides of a frame but showing a somewhat different arrangement of lights.

As shown, the frames are constructed of side members 10 of double channel section of the form indicated in Figure 5, these being two channel members of the form shown in my pending application Serial No. 360,868, filed October 12, 1940, and being welded together back to back.

By using this form of channel member throughout and the fastening means shown, parts may be firmly secured at any point along a channel and no slippage can occur.

As stated, each frame comprises two double channel uprights 10 fixed together at or near the upper ends by a cross member 11 which is shown as a single channel though a double channel member may be used. This cross member 11 is fixed to the side of uprights 10 by means of bent gusset plates 12 of the form shown in Figures 6 and 7, the latter providing diagonal bracing to produce a quite rigid support, but additional diagonal bracing is had by securing to the inner sides of members 10 and to the cross member 11 the short channel sections 13 to which by means of suitable brackets 14 are secured the conduits 15 carrying the lamps 16 and enclosing the wiring therefor.

The conduits 15 are jointed and extend along the sections 13 and also may be secured for a portion of their length along the upright members 10 and the cross members 11, and the number of lamps 16 carried by each of the sections will of course be determined by the size and contour of the article being dried.

The attachment of the section 13 to the upright 10 and to the cross member 11 is preferably through a hinged bracket, as indicated at 17, so that the angle to which it is placed may be changed to suit the particular arrangement desired. Further, the hinged bracket used for securing the section to the cross member 11 is of such form as to allow the end of the section 13 to project beyond the cross member. This permits the use of a single length section for a great number of arrangements.

The outer open channel side of the uprights 10 may be used as indicated in Figure 2 for the mounting of a control box 20 and for various longitudinal conduits for bus bars and other electrical equipment, such as is indicated at 21.

In Figure 4 there is indicated a number of different arrangements of the several parts of a frame. For example, the cross member 11 may be near the top of the vertical members 10 or it may be moved down to a lower position as indi-

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cated at 11A. Again, the oven may be made narrower by moving the members 10 toward each other as indicated at 10A. The light supporting sections 13 may be moved up to some other position such as 13A or may be lowered as indicated at 13B, or additional light supporting sections may be added as indicated at 13C so as to change the light contour to suit a particular article.

As indicated in Figure 3, the several frames are fixed together by means of longitudinal members 30 fixed to the top of uprights 10 preferably by bent gusset plates 31 which provide sufficient diagonal bracing to render the oven as a whole sufficiently rigid. Further, the uprights 10 may be secured directly to a suitable floor 40 or to other longitudinal members 41 fixed to any suitable support.

Now having described the invention and the preferred embodiments thereof, it is to be understood that said invention is to be limited, not to the specific details herein set forth, but only by the scope of the claims which follow:

I claim:

1. An oven structure for drying articles by means of infra-red light, consisting of a tunnel formed by fixing to longitudinally extending members a plurality of inverted U-frames each of which consists of a pair of vertical members of channel section opening inwardly, a cross member, also of channel section but opening downwardly, adjustably fixed to the sides of the vertical members, diagonal members adjustably fixed to the inner faces of the vertical members and to the side of said cross member whereby to be located in the plane of the vertical members, wiring conduits extending along and carried by said diagonal members, and suitable lamps carried by said conduits and directed inwardly of the frame.

2. An oven structure for drying articles by means of infra-red light, consisting of a tunnel formed by fixing to longitudinally extending members a plurality of inverted U-frames each of which consists of a pair of vertical members of channel section opening inwardly, a cross member, also of channel section but opening downwardly, adjustably fixed to the sides of the vertical members, diagonal members hingedly fixed to the inner faces of the vertical members and to the side of said cross member whereby to be located in the plane of the vertical members, wiring conduits extending along and carried by said diagonal members, and suitable lamps carried by said

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conduits and directed inwardly of the frame, the hinged connection of the diagonal members permitting the selection of an angle suiting the contour of the article being dried.

3. An oven structure for drying articles by means of infra-red light, consisting of a tunnel formed by fixing to longitudinally extending members a plurality of inverted U-frames each of which consists of a pair of vertical members formed of two channel members welded back to back, a channeled cross member adjustably fixed to the sides of said vertical members and opening downwardly, gusset plates at the junctions of said members, diagonal members, also of channel section opening inwardly of the frame, hingedly and adjustably fixed to said vertical members and in the plane thereof and hingedly and adjustably fixed to said cross member to one side thereof, wiring conduits fixed to the open side of said diagonal members, the ends of said conduits extending along and being fixed to said vertical and cross members, and lamps carried by said conduits and directed inwardly of said frame.

4. In a drying oven using infra-red lamps for drying the coating of articles, a lamp carrying unit capable of being adjusted to arrange the lamps in approximately parallel relation with the contour of the article, said unit consisting of a pair of vertical members, a cross member, gusset plates, adjustable means for fixing said plates to said cross member and to said vertical members to provide an inverted U-shaped frame of the height and width required, relatively short channel section members hinged to the inner faces of said vertical members and inclined thereto means for fixing said short members to the side of the cross member, wiring conduits attached to the inner faces of said short members and to said cross member and infra-red lamps mounted on said conduit and directed inwardly.

5. In a drying oven using infra-red lamps for drying the coating of articles, means for arranging a plurality of infra-red lamps in a line approximating the contour of the article being dried, said means consisting of a supporting frame of vertical side members and a cross member, a plurality of short members carried thereby, one of which is fixed in an inclined position to the inner face of a side member and another of which is fixed to the first short member and to the side of the cross member.

CHARLES W. ATTWOOD.