

Dec. 8, 1959

O. F. ARTHUR

2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Filed June 5, 1957

8 Sheets-Sheet 1

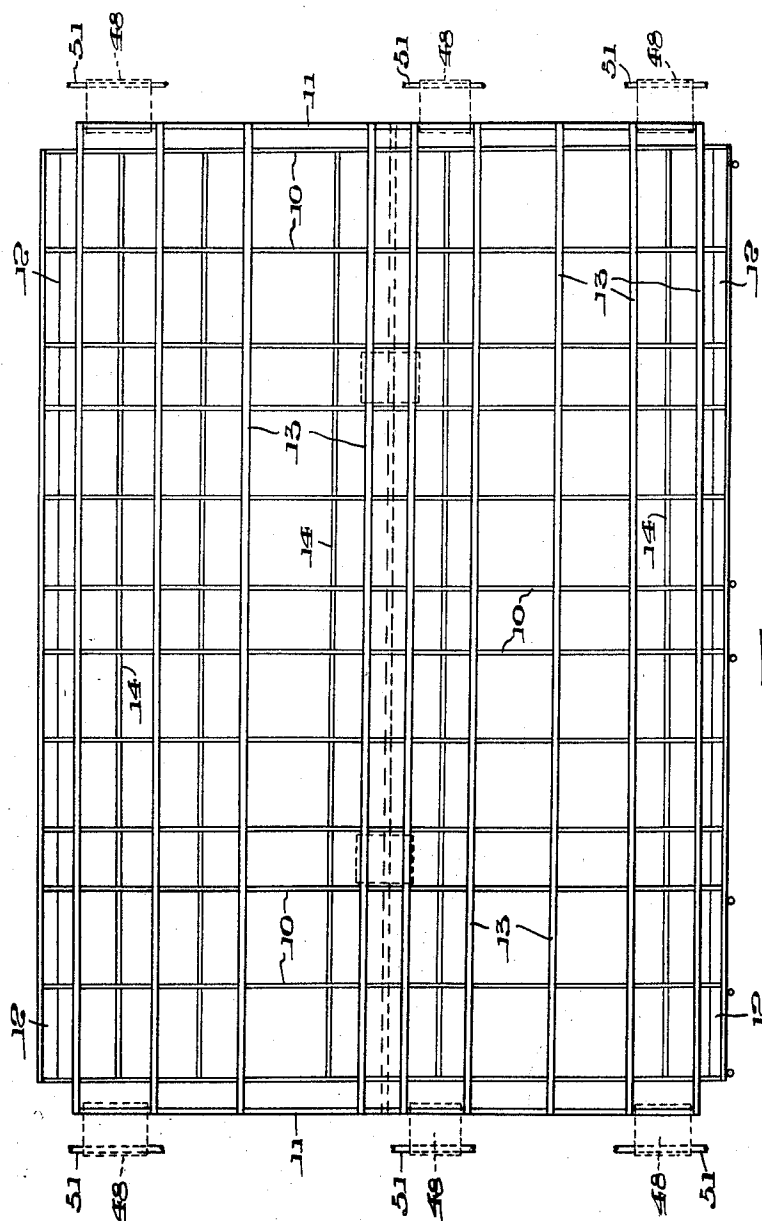


Fig. 1.

INVENTOR.
OSCAR F. ARTHUR.

BY Archworth Martin

his ATTORNEY.

Dec. 8, 1959

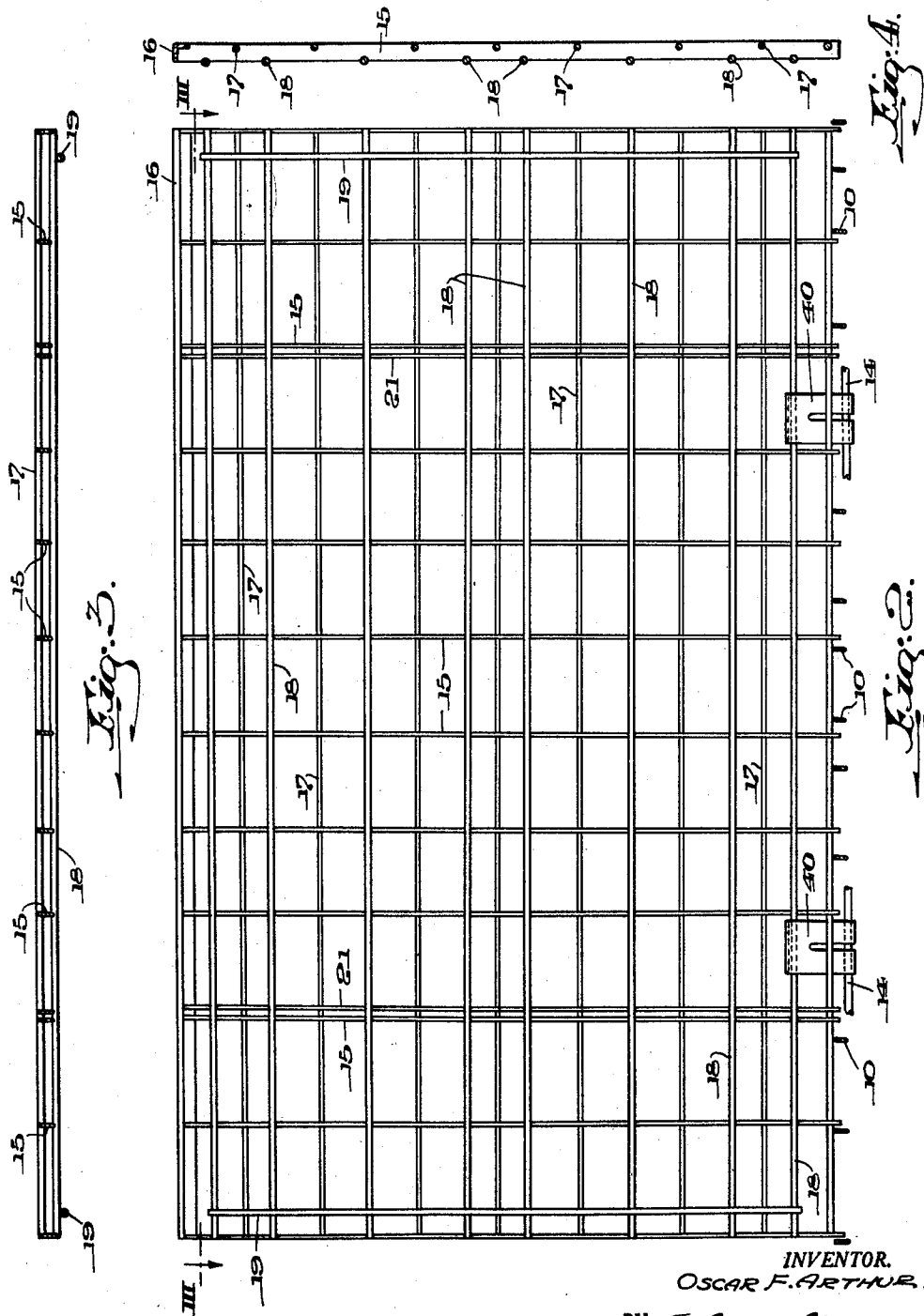
O. F. ARTHUR

2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Filed June 5, 1957

8 Sheets-Sheet 2



INVENTOR.
OSCAR F. ARTHUR.
BY Archworth Martin
his ATTORNEY.

Dec. 8, 1959

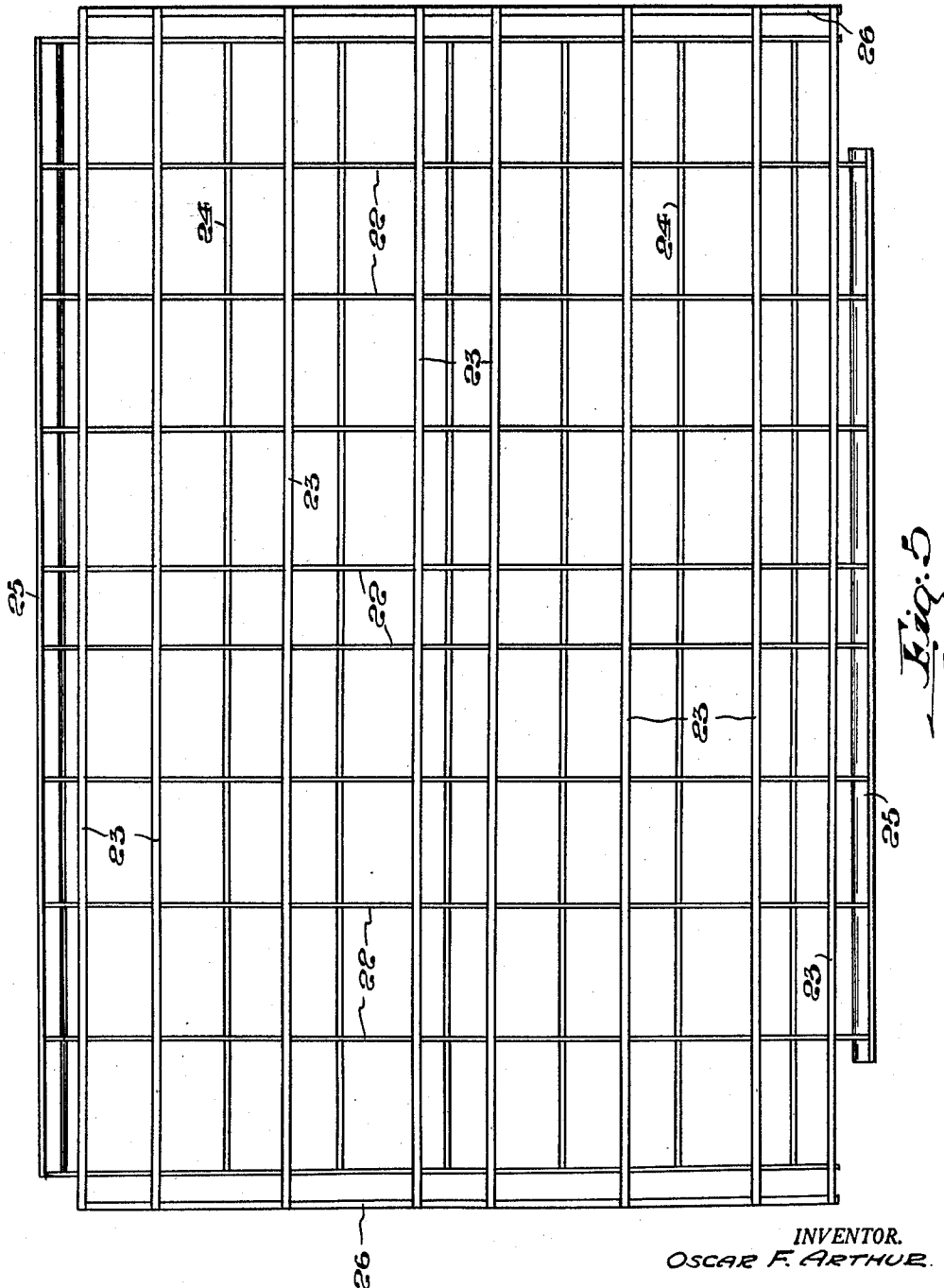
O. F. ARTHUR

2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Filed June 5, 1957

8 Sheets-Sheet 3



INVENTOR.
OSCAR F. ARTHUR.
BY *Archibuth Martin*
his ATTORNEY.

Dec. 8, 1959

O. F. ARTHUR

2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Filed June 5, 1957

8 Sheets-Sheet 4

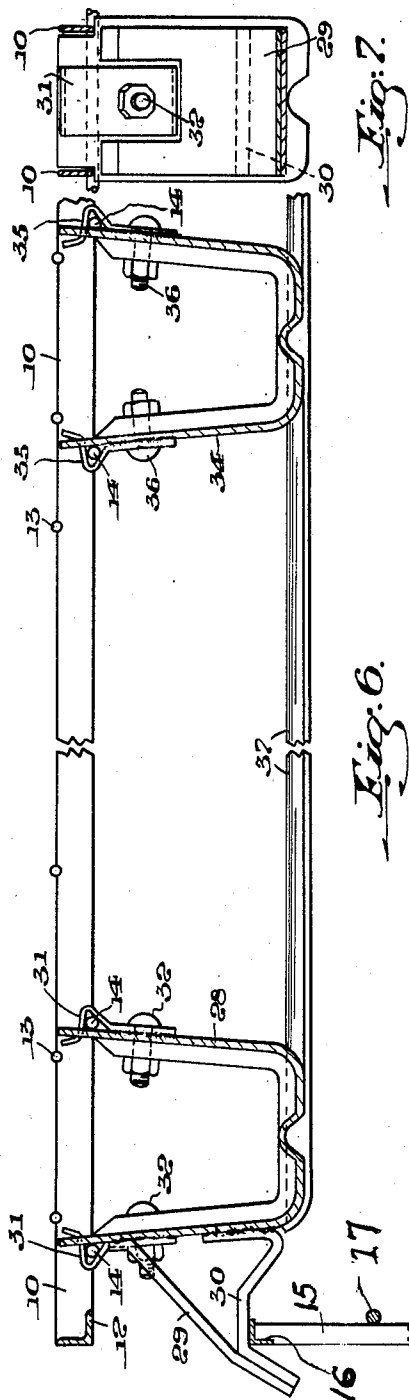


Fig. 6.

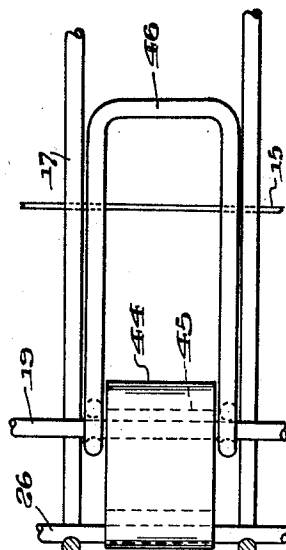


Fig. 13.

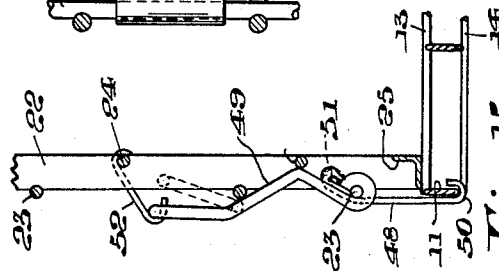


Fig. 15.

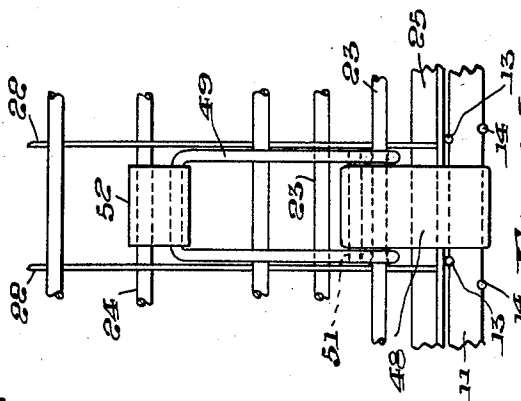


Fig. 14.

INVENTOR.
OSCAR F. ARTHUR.

BY *Archworth Martin*

his ATTORNEY

Dec. 8, 1959

O. F. ARTHUR

2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Filed June 5, 1957

8 Sheets-Sheet 5

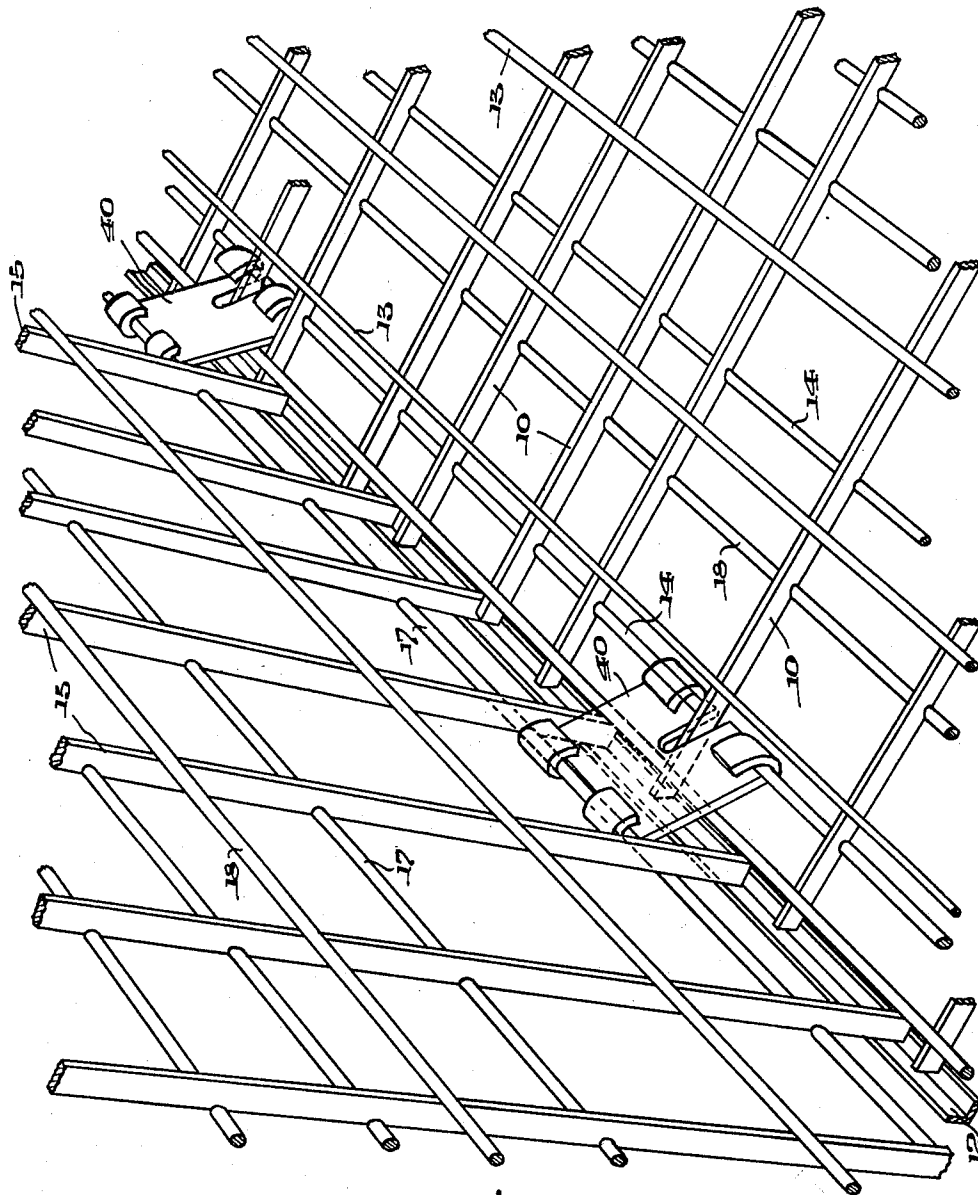


Fig. 8.

INVENTOR.
OSCAR F. ARTHUR.

BY *Archworth Martin*

his ATTORNEY.

Dec. 8, 1959

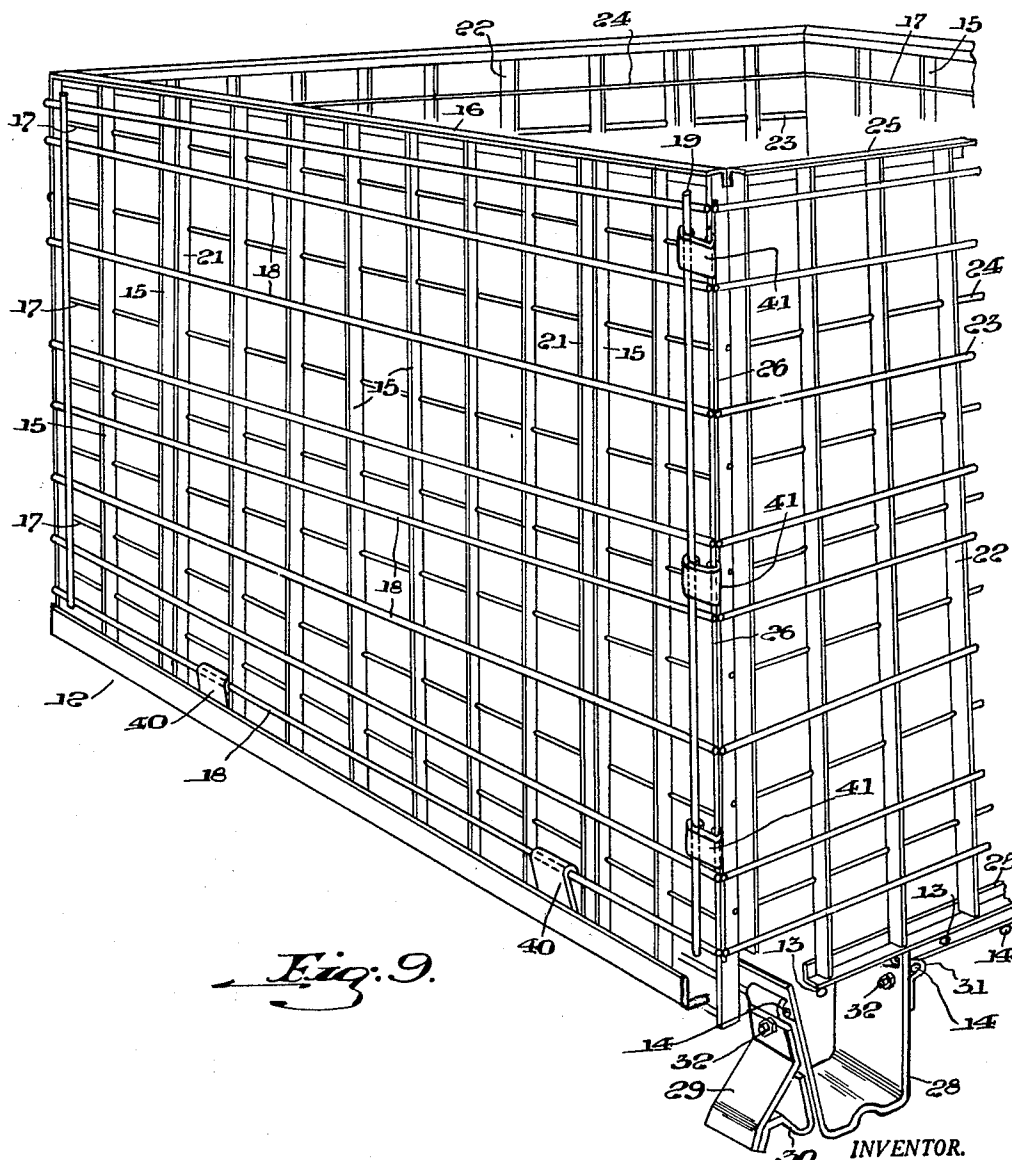
O. F. ARTHUR

2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Filed June 5, 1957

8 Sheets-Sheet 6



INVENTOR.
OSCAR F. ARTHUR.

BY *Cresworth Martin*

his ATTORNEY

Dec. 8, 1959

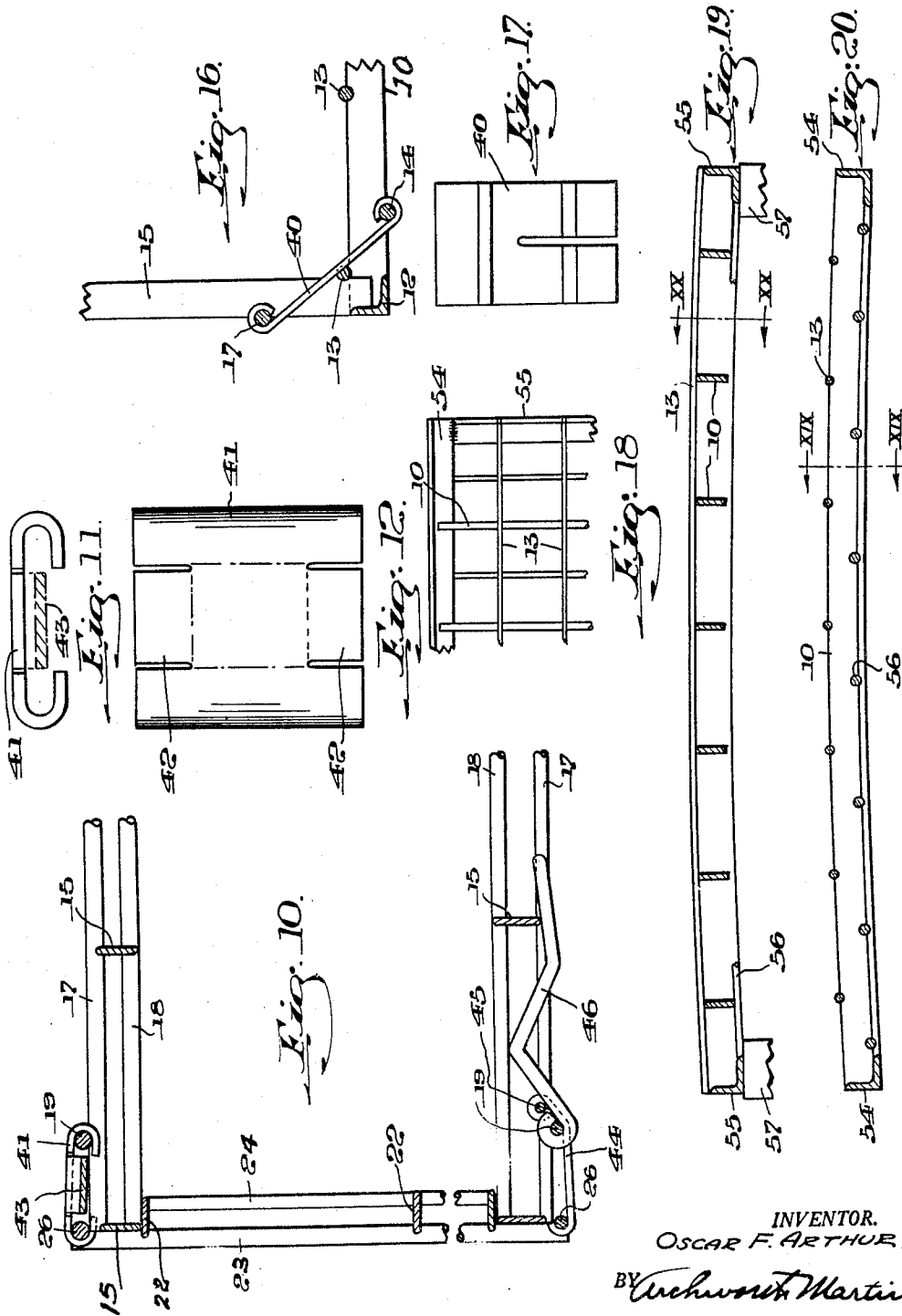
O. F. ARTHUR

2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Filed June 5, 1957

8 Sheets-Sheet 7



INVENTOR.
OSCAR F. ARTHUR.
BY *Archibald Martin*
his ATTORNEY.

Dec. 8, 1959

O. F. ARTHUR

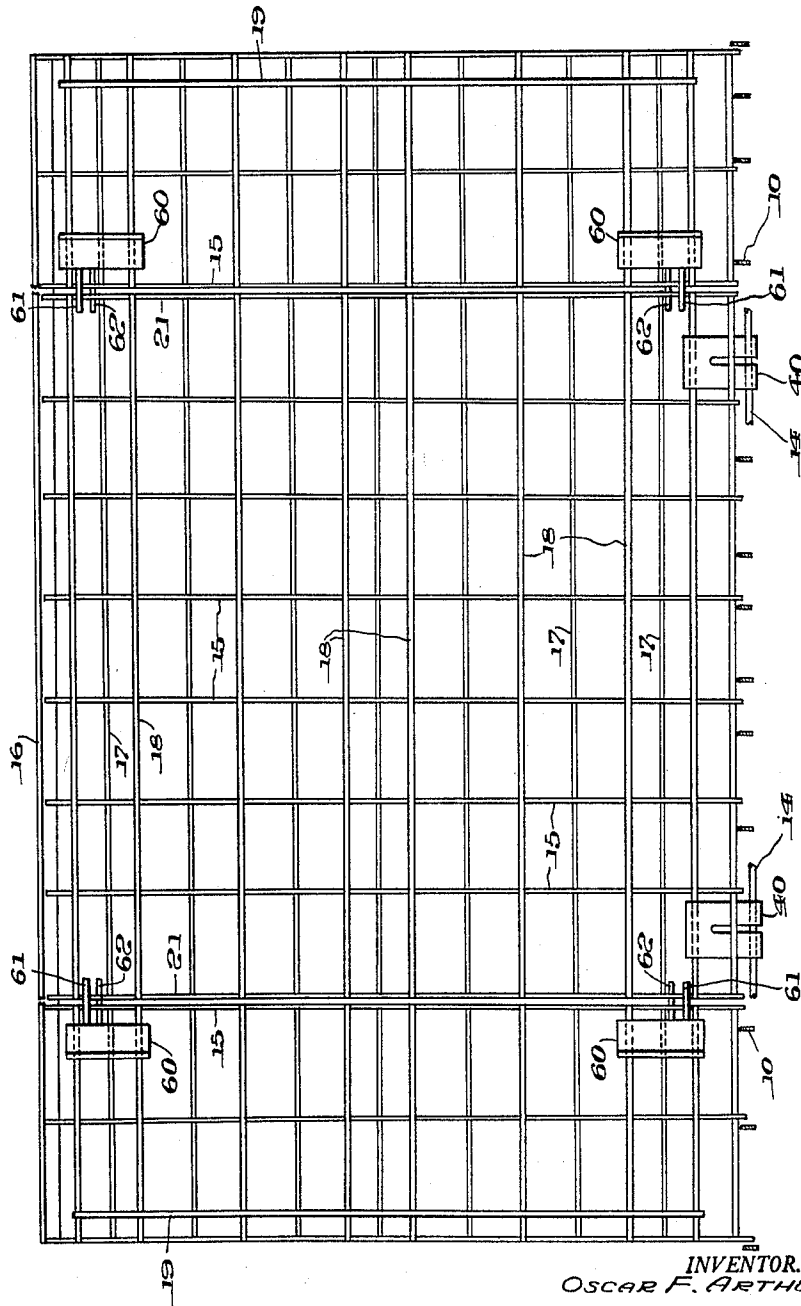
2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Filed June 5, 1957

8 Sheets-Sheet 8

Fig. 21.



INVENTOR.
OSCAR F. ARTHUR

BY *Archibald Martin*

his
ATTORNEY.

1

2

2,916,178

COMBINED PALLET AND CRATE STRUCTURE

Oscar F. Arthur, Silver Spring, Md.

Application June 5, 1957, Serial No. 663,695

6 Claims. (Cl. 220-4)

My invention relates to pallet and crate structures, including structures wherein the bottom or base for the vertical crate walls can be used independently as a pallet.

One of the objects of my invention is to provide a structure of the character referred to, wherein the vertical walls of the crate are utilized in supporting the deck against sagging under loads imposed thereon.

Another object of my invention is to provide a structure wherein the deck-like base for the crate walls is of maximum strength for a given weight or gauge of the metal members from which the deck is formed.

Still another object of my invention is to provide a structural arrangement wherein crate walls and pallets may be carried in stock and readily assembled on location, the decks with their legs being useable simply as pallets or with crate walls of various standard forms and sizes.

A further object of my invention is to provide an improved latch and hinge connections between the vertical walls and the base or pallet.

As shown in the accompanying drawings,

Figure 1 is a plan view of the bottom wall of a crate structure;

Figs. 2, 3 and 4 are side, plan and end views of a crate side wall;

Fig. 5 is an enlarged view of one of the end walls;

Fig. 6 is a sectional view on a still larger scale, showing certain details of the leg and deck structure, in stacked relation to another crate;

Fig. 7 is an end view thereof;

Fig. 8 is an enlarged perspective view of a portion of a side wall and a deck in assembled relation;

Fig. 9 is a perspective view of the complete structure;

Fig. 10 is a sectional plan view of an end wall and two side walls in connected relation;

Fig. 11 is an enlarged plan view of one of the hinges of Fig. 10;

Fig. 12 is a face view of the hinge;

Fig. 13 is an enlarged face view of the latch lever of Fig. 10;

Fig. 14 shows a latch for connecting the deck to an end wall;

Fig. 15 is an edge view thereof;

Fig. 16 is a detailed view showing one of the connections between the deck and a side wall;

Fig. 17 is a face view thereof;

Fig. 18 is a fragmentary plan view of a modified form of deck;

Fig. 19 is a longitudinal sectional view of this modified form of deck;

Fig. 20 is a transverse sectional view thereof, and

Fig. 21 is a view showing the side-wall of Fig. 2 having a hinged panel formed therein.

As shown in Fig. 1, the deck comprises a series of flat bars 10 disposed in vertical planes; flat end bars 11, and longitudinally-extending angle bars 12. Deck rods 13 are sunk welded into the upper edges of the flat bars 10 and 11 (Fig. 16), the rods 10 being welded into the

angles 12 at the longitudinal edges of the deck. A series of rods 14 are sunk welded into the lower edges of the bars 10.

One of the side walls is shown in Figs. 2, 3 and 4 and comprises vertical flat bars 15 whose upper ends are welded to an angle 16. Wires or rods 17 are sunk welded into the outer edges of the bars 15 and other wires or rods 18 are sunk welded into their inner edges.

An additional heavy rod 19 is welded to the outer edges of the wall adjacent to each end thereof, to serve as some of the connecting members by which the end walls are joined to the side walls as hereinafter explained. Also, additional bars 21 are provided adjacent to two of the bars 15, so that if a drop panel is desired, the wires between the adjacent members 21 and 15 can be cut along vertical lines, to provide a drop panel or door as hereinafter explained.

In Fig. 5, one of the two end walls is shown and comprises flat bars 22 into the outer edges of which heavy rods 23 are sunk welded and other additional wires or rods 24 welded into the inner edges of these bars. The bars 22, at their ends, are welded into horizontal angles 25 and rods 26 are welded to the ends of the rods 23 for use in making connections to the vertical edges of the side walls as in Fig. 10.

In Fig. 6, I show the manner in which legs are connected to the deck of Fig. 1, the figure showing also the manner in which the deck legs of one container base may be stacked upon the end walls of a crate upon which the base is placed. The four stacking legs at the corners of the structure each comprises a heavy metal members 28 extending upwardly between adjacent deck bars 10 as shown more clearly in Fig. 7 and each having welded to one face thereof stacking members 29 and 30 arranged in generally hook formation that will rest upon the top angles 16 of the side panels. The legs are detachably connected to the lower deck rods 14 by clips 31 and bolts 32.

Intermediate legs are provided for the larger sizes of decks, and they comprise U-shaped members 34, clips 35 and bolts 36 for connection to the adjacent deck rods 14 as at the corner legs, there being no stacking members 29-30 on the intermediate legs.

Where the containers are to be subjected to heavy duty, floor bars 37 will be welded to the legs, to serve as braces therefor, and they will also be useful when stacking soft lading such as bagged materials.

The side walls are connected to the deck by hinges 40 (Figs. 2 and 8), at each of the two opposite edges of the deck. The inner ends of these hinges are bent around one of the lower deck rods 14, and slots are provided therein which straddle the adjacent flat bars 10, thus preventing shifting of the hinges along the rods 14. At their upper end, the hinges are bent around an adjacent rod 17 and, as shown in Fig. 8, have abutting engagement with the sides of adjacent bars 15, so that there can be no sliding of the side wall on the deck.

The hinges 40 serve an important function in that they transmit a considerable part of the deckload to the side walls, so that lighter gauge bars and rods may be used in the deck, or wider areas of deck without supporting legs are feasible, than if the deck alone had to entirely support all of the loads thereon.

Another advantage of this hinge arrangement is that the walls can be folded compactly on the deck, since when the side walls are raised slightly and swung inwardly to horizontal position, there will be considerable clearance between them and the deck, and both the side walls and the end walls can be placed flatwise relative to the deck.

Hinges 41 are provided for connecting the end walls to the side walls at two corners of the container, as shown

3

more clearly in Fig. 10. As shown in Figs. 11 and 12, these hinges are in the form of plates whose edges are bent for engagement with vertical rods 19 and 26 of the side wall and the end wall respectively, the mid portions 42 of these bent plates being split and bent inwardly at 43 to hold the hinges against displacement from the rods 19 and 26.

At two other corners of the crate, hinge members 44 are connected to adjacent vertical rods 26 and are bent to knuckle form at their outer ends about pintles or short rods 45 (Figs. 10 and 13) that are welded in each instance, to a latch lever 46 that is pivotally connected to an adjacent vertical rod 19. When the lever 46 is swung in a clockwise direction from the position shown in Figs. 10 and 13, it will pivot about the rod 19, thus swinging the hinge leaf 44 in a clockwise direction. This movement will disengage the semi-circularly curved end of the plate 44 from the rod 26, thus disengaging the end wall from the side wall. The end wall can then be swung into open position, when its lower hooks have been disengaged from the deck, as will be hereinafter explained.

Contrariwise, when the lever is swung inwardly toward the side wall, it will draw the end wall 23-24 and its hinge 41 in a direction to clamp the side walls against the end wall, the pintle 45 and its knuckle being swung past over-center position as shown in Fig. 10, to hold the side and end walls firmly in clamped engagement.

In Figs. 1, 14 and 15, hinge leaves or plates 48 and latch levers 49 of forms similar to the members 41 and 46 are provided for connecting the end walls to the deck, the lower ends of these members 48 being loosely hooked to adjacent deck bars 11, as shown at 50 in Fig. 15. The upper end of each plate 48 is bent to form a knuckle that embraces a pintle 51 which is welded to the lever 49. The lever is hinged to one of the rods 23, so that when it is swung in a clockwise direction as viewed in Fig. 15, the knuckle of the member 48 and its pintle 51 will be swung overcenter with respect to the said rod 23 and the bar 11.

In order to prevent accidental swinging of the lever 49 to release position, a hook 52 is provided. When the lever 49 is swung in a clockwise direction, the hook at 50 will be disengaged from the deck and the end wall can be removed.

In Figs. 18, 19 and 20, I show details of a deck which may be cambered as heretofore mentioned. In this instance, there is a rectangular framework of angle bars 54 and 55 at the sides and ends of the deck, the deck bars 10 being welded into the angles 54 and the deck rods 13 are sunk welded into the upper edges of the bars 15 and angle 55. The lattice work thus formed by the bars 10 and 13 is of cambered or bowed form at its mid area, with consequent greater strength than if they were simply in flat planes.

Rods 56 are welded to the bars 10 and the angles 55 and serve as tension members against loads that are imposed upon the surface of the deck. These rods also serve as guards or shields against damage to the deck by lift forks. Suitable legs will, of course, be provided at the corners of the deck as indicated at 57.

Referring now to Fig. 21, I show a manner in which the side walls of Fig. 2 can be readily modified to suit a customer's needs, where a drop side panel or door is desired. To this end, vertical cuts will be made through the bars 16, 17 and 18, along lines between the bars 15 and 21 near each end of the crate. This will allow that portion of the side wall to swing downwardly. Latches are provided for releasably holding the drop panel in upper position, such latches could be of any suitable form but are here shown as latch plates 60 slidably supported

4

on rods 18 and having forklike fingers 61 and 62 that straddle the rods 15 and 21 when in latching position.

I claim as my invention:

1. A combined pallet and crate structure comprising a deck serving as a bottom for the crate and provided with legs at its corners, vertical walls carried by the deck, hinge members connected at their upper ends to two opposite walls and sloping downwardly and inwardly and connected to the deck at points set inwardly from the edges thereof and intermediate the legs, the said hinge members being of sufficient strength to transmit substantial load strains from the deck to the vertical walls, latch members detachably connecting the other two vertical walls to the deck intermediate the corners of the deck and having hook portions extending below the deck, to provide vertical support therefor, and members connecting the second-named walls to the first-named walls, at vertical corners of the crate.

2. A structure as recited in claim 1, wherein the hooks are moved vertically by levers that are pivotally mounted on horizontal bars on the vertical walls, and means are provided for releasably holding the levers in position to maintain the hooks in gripping engagement with the deck.

3. A combined pallet and crate structure comprising a deck having rectangularly-arranged crate walls thereon, means connecting the crate walls together at the four corners of the structure, and means connecting two opposite vertical walls to the deck, comprising hook members engageable against the undersurface of the deck, levers pivotally connected to the said walls and to the upper ends of said hook members, the pivotal connections between the levers and the hook members being so positioned that when the levers are swung upwardly, their pivots on the upper ends of the hooks are moved upwardly and inwardly past the pivotal connections of the levers to the said two walls, thereby clamping these walls and the deck firmly together.

4. A structure as recited in claim 1, wherein the deck is composed of bars and rods welded in relatively crossed relation and is of upwardly convex cambered form.

5. A load-supporting pallet comprising a deck having flat bars that are laterally-spaced with their sides vertical, deck rods welded crosswise into the upper edges of the bars, a relatively heavy rectangular frame welded to the ends of the rods and bars, tension rods welded crosswise of the lower edges of the bars and to the frame members at their ends, the deck rods and the flat bars being bowed slightly upward at the mid zone of the deck, and legs at the corners of the deck.

6. A load-supporting pallet comprising a deck having flat bars that are laterally-spaced with their sides vertical, deck rods welded crosswise into the upper edges of the bars, a relatively heavy rectangular frame welded to the ends of the rods and bars, the deck rods and the flat bars being bowed slightly upward at the mid zone of the deck, and legs at the corners of the deck.

References Cited in the file of this patent

UNITED STATES PATENTS

915,565	Davison	Mar. 16, 1909
2,530,148	Bjorklund et al.	Nov. 14, 1950
2,539,024	Leiby	Jan. 23, 1951
2,575,149	Watson	Nov. 13, 1951
2,641,396	Parr	June 9, 1953
2,700,522	Averill et al.	Jan. 25, 1955
2,780,382	Beckner et al.	Feb. 5, 1957

FOREIGN PATENTS

994,237	France	Oct. 3, 1951
---------	--------	--------------