Sept. 2, 1958 H. REHRIG 2,850,199

MILK CRATE

Filed Dec. 30, 1955 2 Sheets-Sheet 1

FIG. 1.

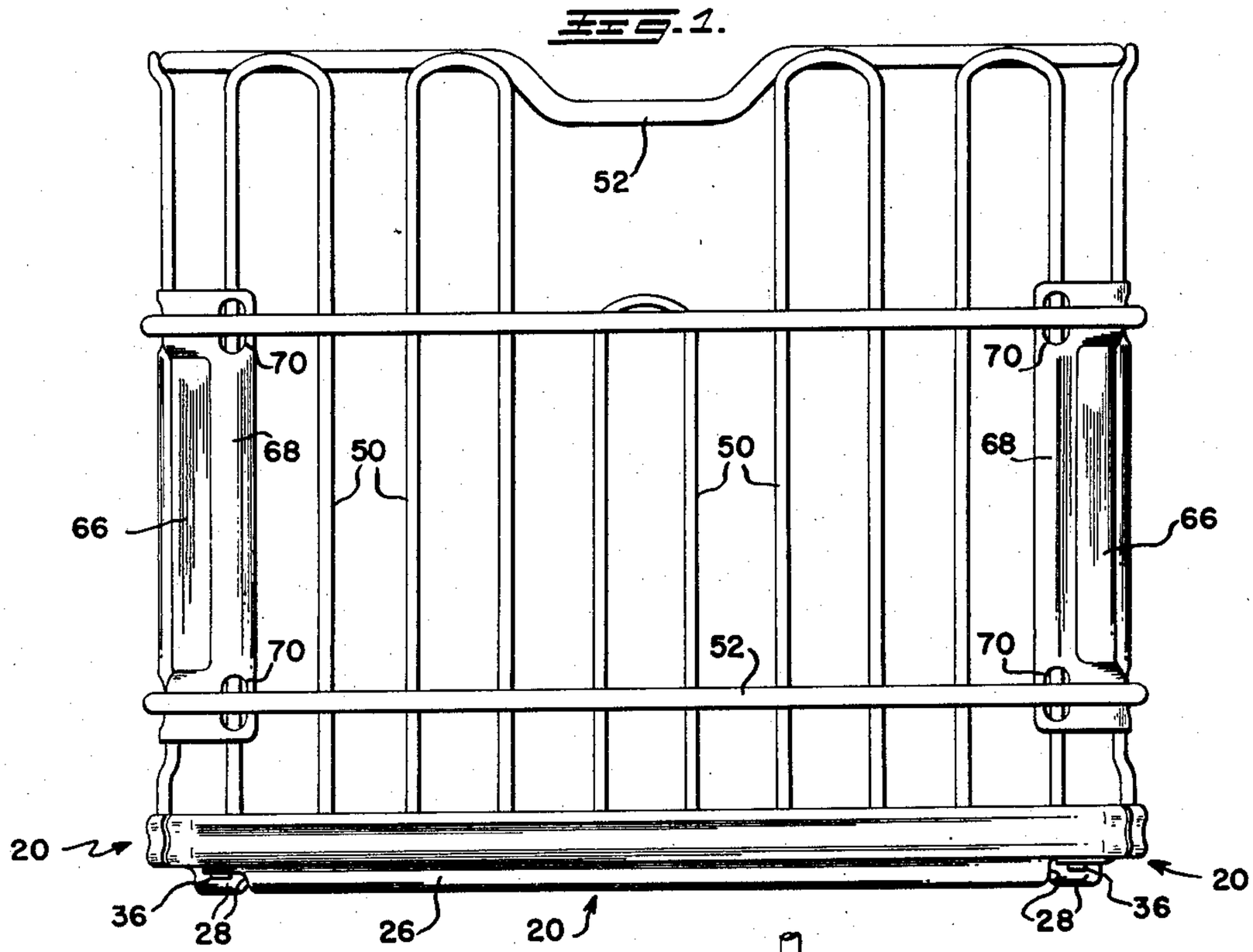


FIG. 5.

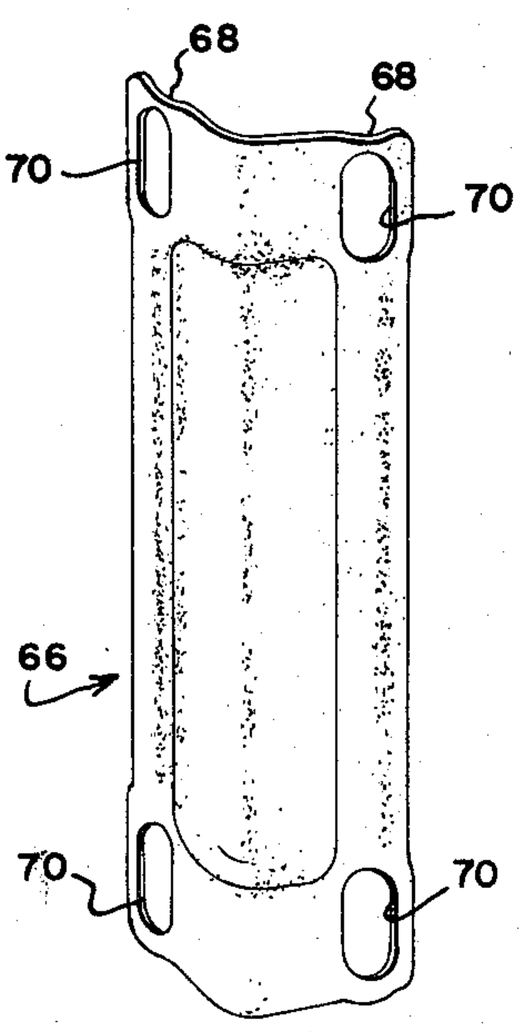
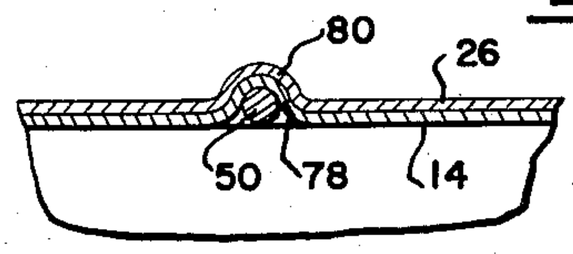


FIG. 7.

FIG. 8.



INVENTOR

HOUSTON REHRIG

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MILK CRATE

Filed Dec. 30, 1955 2 Sheets-Sheet 2

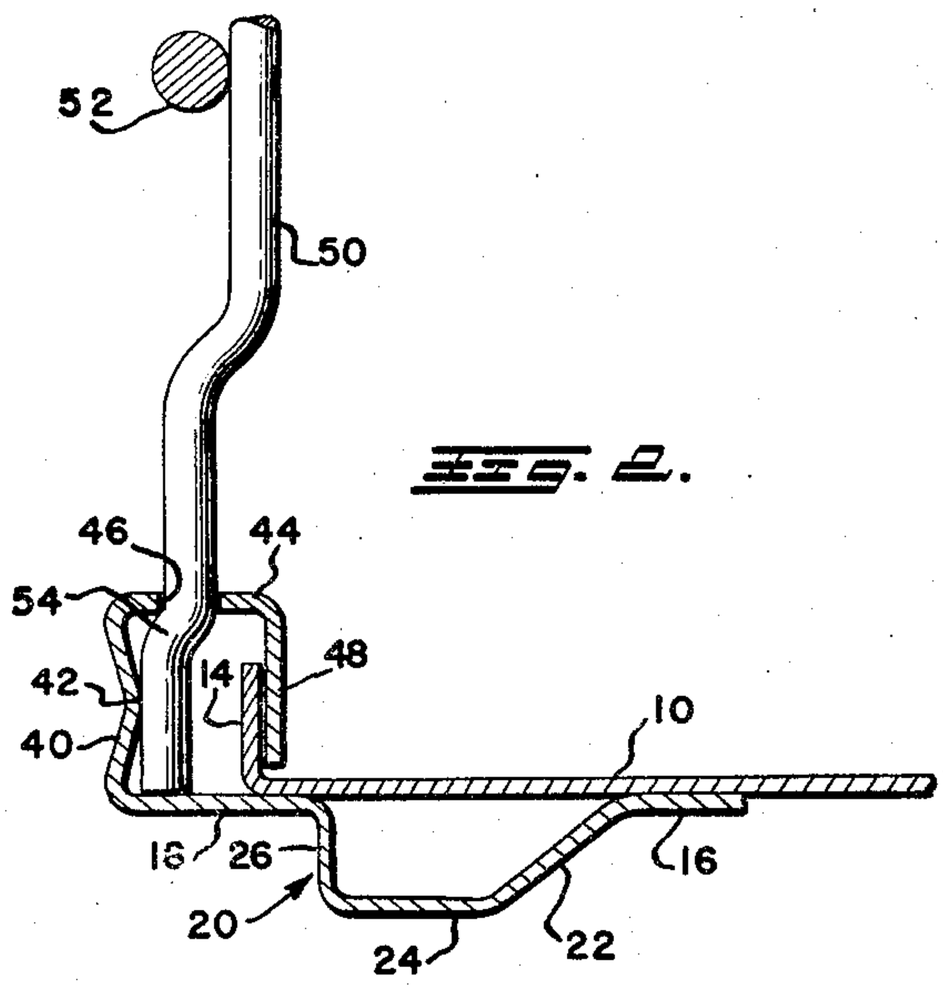

FIG. 2.

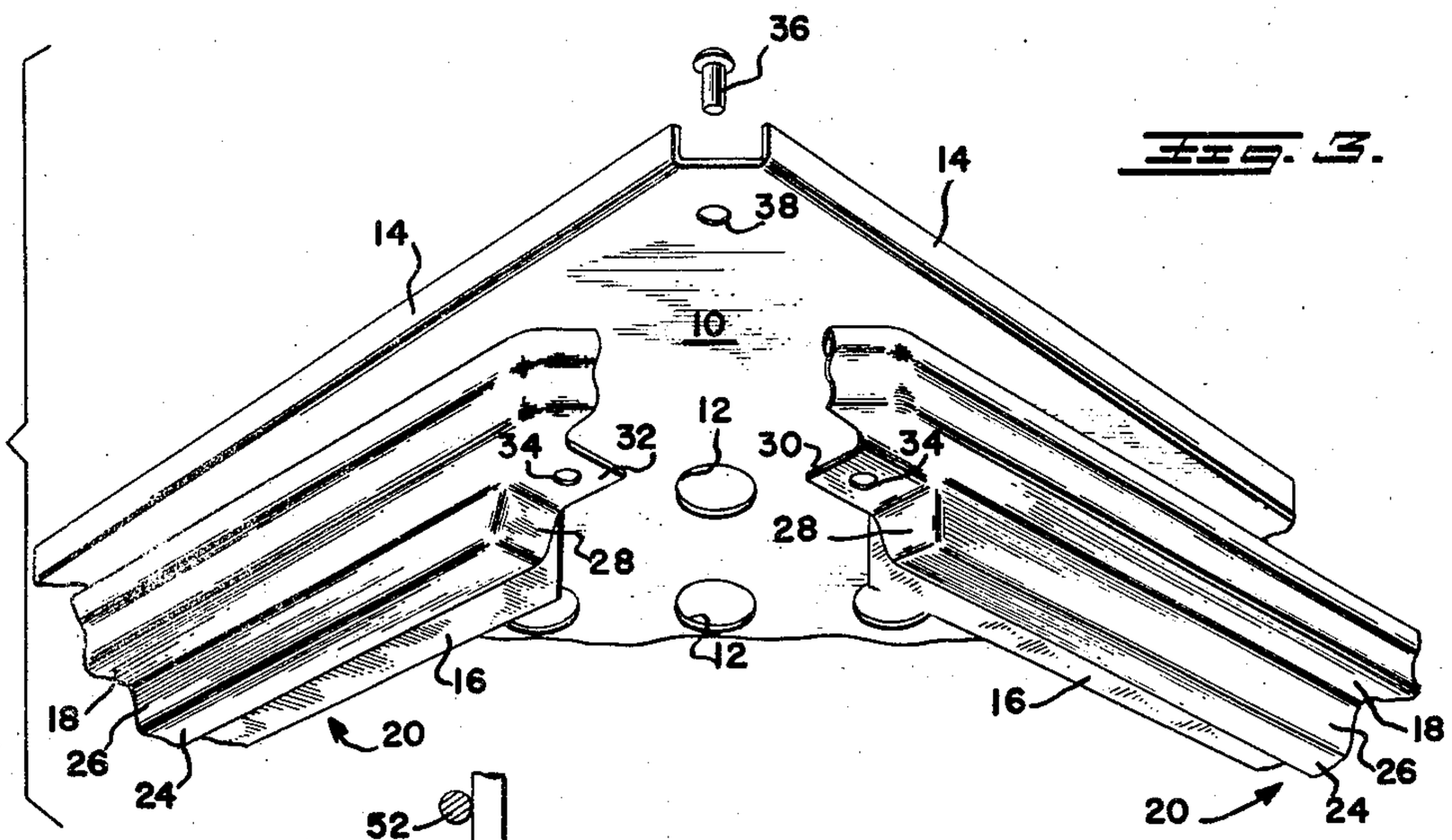

FIG. 3.

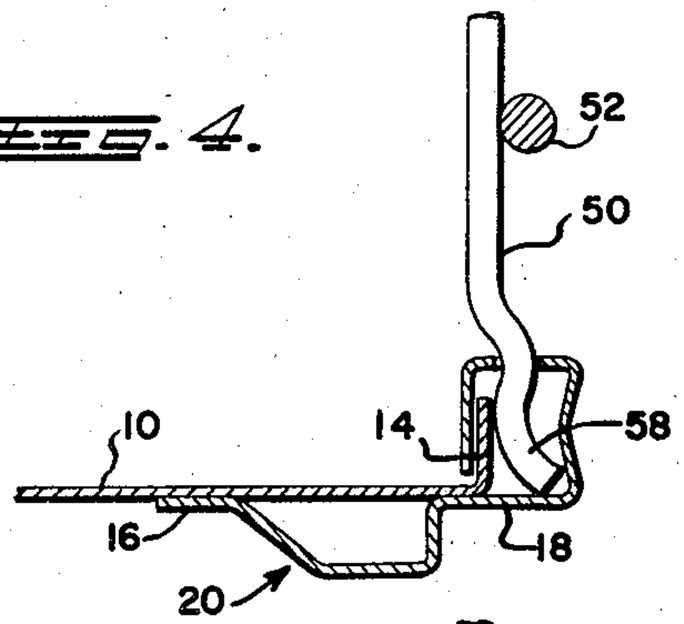

FIG. 4.

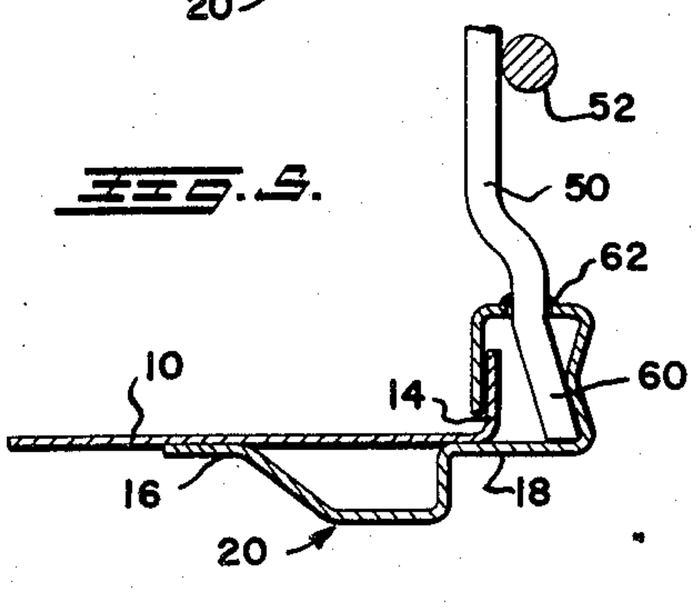

FIG. 5.

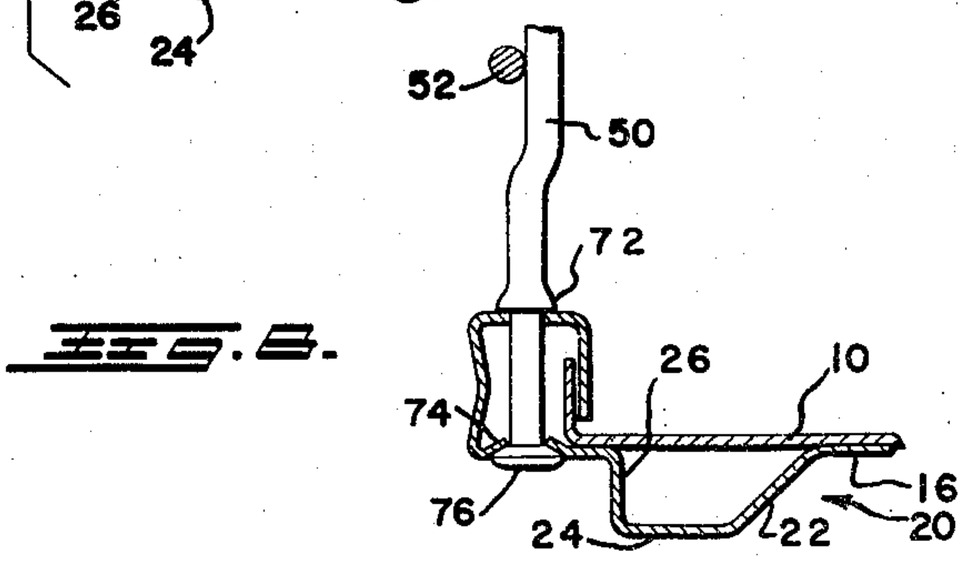

FIG. 8.

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MILK CRATE

Houston Rehrig, Los Angeles, Calif., assignor to Rehrig Pacific Company, Los Angeles, Calif., a corporation of California

Application December 30, 1955, Serial No. 556,587

12 Claims. (Cl. 220—19)

This invention relates to milk crates and in particular concerns a wire crate having a sheet metal bottom.

A major object of my invention is to provide a crate with wire sides assembled on a bottom sheet in a sturdy and rigid manner with a minimum number of permanent joints or connections.

Another object of my invention is to provide a crate in which wire sides may be readily assembled on a sheet metal bottom.

Still another object of my invention is to provide an improved guard for protecting exposed corners of wire sides of a crate.

In the achievement of the foregoing, and other objects, one of the features of my invention resides in an integral stacking rail-side rail element in which a stacking rail portion is provided with a pair of spaced, horizontal surfaces for supporting the side edges of the sheet-like bottom, and a side rail portion projecting upwardly above the outer surface of the stacking rail to form a side rail having, in most instances, a hollow, box-like configuration. An upper surface of the stacking rail is provided with a series of spaced openings or holes for the reception of the ends of the wire side members. An outer side wall of the stacking rail is preferably crimped or bent inwardly to engage side members and provide additional support therefor. In most forms of the invention, no permanent securing of the side members to the side rails is required and where such securing is, in fact, employed a light weld may be used. In the interior of the side rails the wire side members are, as a general rule, offset to prevent direct vertical withdrawal of the side members from the holes. By the foregoing construction, the wire or rod-like side members engage three separated points within the side rail, thus greatly increasing the rigidity of the side member.

When wire crates are employed for handling cardboard milk containers, the containers located in the corner of the crate are exposed between the end wires of adjacent sides. To protect the container at this location, I have provided a sheet metal corner guard formed with grooves adapted to receive the end wires of adjacent sides. An elongated, oval shaped hole is formed and extends transversely across each of the grooves at each end of the corner guard, so that the horizontally disposed tie members may be directly welded to the end side members within this hole, thus obviating the necessity of welding the corner guard directly to the wire side members.

Other features, advantages and objects of my invention will become readily apparent by reference to the following specification taken in conjunction with the accompanying drawings.

In the drawings:

Fig. 1 is a side view of a crate embodying the invention;

Fig. 2 is a cross sectional view through the stacking rail-side rail and disclosing one form of side member;

Fig. 3 is an exploded view of the bottom sheet and a pair of adjacent stacking rail-side rail elements;

Fig. 4 is a cross sectional view similar to Fig. 2 showing another form of side member;

Figs. 5 and 6 are cross sectional views similar to Fig. 2 showing further embodiments of the invention;

Figs. 7 and 8 disclose still another form of the invention, Fig. 7 being an isometric sectional view and Fig. 8 being a partial plan view; and

Fig. 9 is an isometric view of the corner guard.

The crate shown in the drawings is especially adapted for handling the familiar one quart cardboard milk containers. It includes a sheet metal bottom **10** which is preferably provided with a plurality of suitably located drainage holes **12**. As best seen in Figs. 2 through 5, the side edges of the sheet metal bottom are bent to form an upturned flange **14** extending along the major portion of each side edge of the bottom **10**. Bottom **10** is supported, as best seen in Figs. 2, 4 and 5 upon a pair of spaced horizontal surfaces **16** and **18** of a stacking rail-side rail element indicated generally by the numeral **20**.

A separate stacking rail-side rail element **20** is provided for each side of the crate. Each of the elements **20** is identical and is formed, as best appreciated in Fig. 3, from a single blank of sheet material. In addition to the horizontal bottom supporting surfaces **16** and **18** referred to above, each element **20** is formed with a depending stacking rail located between the surfaces **16** and **18** which includes an inclined inner side surface **22**, a bottom surface **24** and a substantially vertical outer side surface **26**. As best seen in Fig. 3, the stacking rail does not extend the entire length of element **20**, but terminates at end surfaces **28**, the longitudinal locations of which are best illustrated in Fig. 1. The locations of end surfaces **28** are such that when the elements **20** are assembled upon the bottom, the juncture of surfaces **22** and **24** of adjacent elements **20** is substantially continuous around the crate, while an interior angle is formed by adjacent end surfaces **28**, eliminating the single sharp corner which would otherwise be present in this region.

Elements **20** are secured to the crate bottom by mounting tabs **30**, **32** extending outwardly from end surfaces **28**. In order that the mounting tabs of adjacent elements **20** may be overlapped during assembly, mounting tab **30** at one end of an element **20** is located in a horizontal plane below the plane containing the mounting tab **32** at the opposite end of the element. Thus, when the elements **20** shown in Fig. 3 are assembled upon the bottom, mounting tab **32** will lie against bottom **10**, while mounting tab **30** on the adjacent rail will lie upon mounting tab **32**. By locating the elements **20** in head to tail relationship, all elements may be constructed in an identical manner while at the same time permitting the overlapping assembly in the corner regions. As best appreciated in Fig. 3, each mounting tab is provided with a hole **34** for reception of rivet **36** which passes through hole **38** in bottom **10** to secure elements **20** to the bottom. By the foregoing construction, only four rivets are required to assemble the four elements **20** upon the bottom of the crate.

The side rail portion of element **20** is formed in the Fig. 2 embodiment, with an outer side wall **40** which is extended upwardly from the outer edge of horizontal surface **18**. As best shown in the cross sectional views of Figs. 2, 4 and 5 outer side wall **40** is formed with a longitudinal inwardly directed crease **42** which provides improved longitudinal rigidity to the side rail and further provides a bearing surface for the side members which will be discussed in greater detail below. An upper surface **44** extends inwardly from outer side wall **40** and is provided with a series of longitudinally spaced holes **46** for the reception of the side members of the crate. An inner side wall **48** extends downwardly from upper surface **44** and terminates somewhat above horizontal surface **18** to define a slot in which bottom **10** is received. Inner side

wall **48** thus overlies bottom **10** and, in its assembled relationship, is located to lie against the inner surface of upturned flanges **14** of bottom **10**. The side rail portion of element **20**, when assembled upon bottom **10**, thus provides a hollow, box-like rail extending entirely along the sides of the bottom to afford a convenient structure for assembling the rod-like side members upon sheet-like bottom **10**. As best appreciated in Fig. 3, the end portions of the side rail may be rounded or bent inwardly at the ends to define a rounded corner on the assembled crate.

The sides of the crate are constructed from rod-like wire side members **50**. As best seen in Figs. 1 and 2, one structural arrangement finds the vertical side members shaped in the form of an inverted U whereby the assembly operation may be performed more conveniently. Horizontally extending tie members **52** are secured around the periphery of the side walls, as by welding, to provide increased rigidity and maintain side members **50** in place within the side rails.

Referring now to Figs. 2, 4 and 5, it will be noted that the lower portion of side members **50** pass downwardly through holes **46** in the side rail to rest upon horizontal surface **18**. In each of these embodiments, the portion of side members **50** which are located within the side rail are offset in order that the side member may be engaged, in a horizontal direction, not only by the walls of holes **46** but also by a side wall of the side rail. Referring to the Fig. 2 embodiment, side member **50** is inserted into hole **46** from above, and the member is manipulated until the side member is in the position shown in Fig. 2. This places an offset portion **54** immediately beneath upper surface **44** at one side of hole **46** and forms a shoulder whereby direct vertical withdrawal of side member **50** from hole **46** is not possible. Prior to the joining of tie members **52** to the side members **50**, side members **50** are free to move, from the position shown in Fig. 2, only in a counterclockwise pivotal movement about the left-hand edge of hole **46**. Movement in a plane at right angles to the cross sectional plane of Fig. 2 is prohibited because of the U shaped formation of side members **50**, while the engagement between side members **50**, the right-hand edge of hole **46** and crease **42** prohibits a clockwise displacement of side members **50**. When tie members **52** are secured around the periphery of the sides, side members **50** cannot move in any direction and are thus firmly secured to the side rail in the complete absence of any direct permanent connection between side members **50** and element **20**.

A second form which side members **50** may take is shown in Fig. 4. In this case, the lower portion of side member **50** is bent into a generally S configuration wherein the lower loop **58** of the S is engaged between upturned flange **14** of bottom **10** and the portion of side wall **40** below crease **42**. By offsetting the portion of side member **50** immediately above hole **46**, the side member may be disposed to lie in the same vertical plane as inner side surface of side wall **48** of the side rail and tie members **52** may be located somewhat closer to the side rail than in the embodiment shown in Fig. 2.

Still another embodiment is disclosed in Fig. 5. In this case, the lower end **60** is offset at a slight angle to the vertical whereby portion **60** may engage outer side wall **40** below crease **42**. In this embodiment, it has been found desirable to assist the wedging engagement between portion **60** and outer side wall **40** in preventing vertical withdrawal of side member **50** by welding as at **62**.

The embodiment disclosed in Fig. 6 finds side members **50** being formed with an enlarged headed portion **72** positioned to be supported upon upper surface **44** of the side rail. Horizontal surface **18** is provided with a series of spaced longitudinal openings **74** which are preferably formed by punching to provide a recess for the

reception of a rivet head **76** formed on the lower end of side members **50**.

In the embodiment shown in Figs. 7 and 8, a modified type of side rail is disclosed. In this construction, the outer surface **26** of the stacking rail is continued directly upward and cooperates with flange **14** of bottom **10** to define the side rail. The upper portion of surface **26** and flange **14** are formed with nesting grooves or rib-like projections **78** and **80** respectively to receive the lower end of side member **50**. A horizontal opening **82** passes through the lower end of ribs **78** and **80** to receive the lower end of side members **50** which, in this embodiment, is bent at right angles to the vertical portion of member **50**. The portion of side members **50** protruding from hole **82** may be either riveted or welded to the outer surface of surface **26** to secure side members **50** in position.

One problem which has arisen in connection with wire side crate is that the square configuration of a cardboard milk container causes the corner of the container to project somewhat beyond the end side members whereby the outer corner of the cardboard container is unprotected. In order to overcome this undesirable feature, it has been proposed to shield this region by sheet metal corner guards. Since the most convenient method of attaching such guards to the wire sides is by welding, a further problem has arisen in that the lighter gauge of the sheet material employed in the corner guard heats up much more rapidly than the heavier metal employed in the side member or horizontal tie members. If sufficient heat is applied to provide a good bond upon the wire members, frequently the lighter gauge sheet metal of the corner guard is burned away. Conversely, if the heat is regulated to an amount which does not affect the lighter sheet metal, frequently the wire members are not heated sufficiently to provide a secure bond.

Referring now to Fig. 9, the foregoing problem may be solved by employing a lightweight sheet metal corner guard **66**. The sheet is bent into a right angled configuration and is provided with longitudinally extending grooves **68** shaped and located to receive legs of side members **50**. Elongated holes **70** of generally oval shape are formed in corner guard **60** whereby guard **66** may be placed in position upon the side members and tie members **52** may engage side members **50** directly within holes **70**. By disposing side members **50** on the inner side of guard **66** and passing tie members **52** around the outer surface of guard **66** (Fig. 1), side members **50** and tie members **52** may be welded directly to each other with no need whatsoever of performing any welding directly on corner guard **66**.

The foregoing construction is readily adaptable to mass production, employs a minimum number of parts, and achieves a wire sided crate of extremely rigid construction. A positive and rigid connection is achieved between the wire side members and the sheet like bottom by the employment of only four rivets. The welding required in ordinary crates of this type is reduced to an absolute minimum, since in most cases no weldments are necessary between the side members and the bottom. The only weldments which are absolutely essential in the carrying out of my invention are those which are ordinarily employed to secure the side members and tie members to each other.

I claim:

1. A crate comprising a bottom of sheet material having upturned flanges extending along each side thereof, stacking rails extending along each side of said bottom to support said bottom thereupon, means integral with said stacking rails projecting upwardly therefrom into abutment with said flanges to define side rails extending along each side of said bottom, each of said side rails having a plurality of longitudinally spaced openings therein, rod-like side members supported in said openings and projecting upwardly therefrom to define the

sides of said crate, and tie members extending around the sides of said crate to maintain said side members in position in said openings.

2. A crate comprising a bottom sheet, hollow box-like side rails secured to and extending along each side of said bottom, rod-like side members projecting upwardly through holes in said side rails, each of said side members having an offset lower portion located within the interior of said side rail engaging an interior side surface of said side rail at a position spaced from said hole, tie members extending around the periphery of said crate and secured to each of said side members at a position spaced above said side rail to prevent disengagement of said offset lower portions of said side members from said interior side surfaces to thereby maintain said side members in assembled relationship with said hollow side rails.

3. A crate comprising a bottom sheet, stacking rails secured to and extending along each side of said bottom to support said bottom thereupon, a side rail portion integral with each of said stacking rails and projecting upwardly therefrom to surround the associated side edge of said bottom defining therewith a hollow, box-like side rail extending the length of each side of said bottom, rod-like side members having generally vertical upper portions projecting upwardly from holes in said side rails to define the sides of said crate, each of said side members engaging said side rail at the sides of said hole and having an integral lower portion offset from said upper portion to engage an interior side surface of said side rail at a position spaced below and to one side of said hole, and tie members extending around the periphery of said crate and secured to each of said side members at a position spaced above said side rail to maintain the upper portions of said side members in their generally vertical position to maintain said side members in assembled relationship with said side rails.

4. A crate comprising a bottom, upturned flanges integral with said bottom and extending along a portion of each side thereof, a stacking rail element extending along each side of said bottom and supporting said bottom thereupon, an integral side rail upon each of said stacking rails comprising an outer side wall projecting upwardly from said stacking rail, an upper surface projecting inwardly from said outer side wall and an inner side wall projecting downwardly from said upper surface into engagement with the inner surface of the associated upturned flange, rod-like side members projecting upwardly from said stacking rail through holes in said upper surface, each of said side members engaging said side rail at said holes and said outer side wall to prevent direct vertical withdrawal of said side members from said holes.

5. A crate comprising a bottom of sheet material, stacking rails secured along each side of said bottom to support said bottom thereupon, side rails integral with each of said stacking rails, rod-like side members supported in said side rails, corner guards of sheet material each having a pair of longitudinal grooves therein receiving and overlying the side members located adjacent a corner of said crate, and tie members secured around the outer periphery of the sides of said crate, overlying said corner members and directly secured to said side members received in said grooves within enlarged openings in said corner guards.

6. A crate comprising a bottom of sheet material having upturned flanges extending along each side thereof, stacking rails extending along each side of said bottom to support said bottom thereupon, means integral with said stacking rails projecting upwardly therefrom into abutment with said flanges to define hollow, box-like side rails extending along each side of said bottom, each of said side rails having a plurality of longitudinally spaced openings through the upper wall thereof, rod-like side members supported within said side rails and projecting

upwardly through said openings to define the sides of said crate, offset lower portions on each of said side members engageable with at least two interior surfaces of said side rails, and tie members extending around the sides of said crate to maintain said lower portions of said side members in engagement with said surfaces.

7. A crate comprising a bottom of sheet material, stacking rails extending along each side of said bottom to support said bottom thereupon, hollow box-like side rails integral with said stacking rails and extending from said stacking rails outwardly and upwardly around the edges of said bottom to define hollow, box-like side rails extending along each side of said bottom, each of said side rails including a lower wall projecting beyond the associated edge of said bottom, an outer wall projecting upwardly from said lower wall, and an upper wall overlying said lower wall and projecting inwardly from said outer wall beyond said edge of said bottom, a series of spaced openings in said upper wall located inwardly of said rail from the outer wall thereof, rod-like side members received in said openings and projecting upwardly from said rails to define the sides of said crate, and a lower portion on each of said side members extending downwardly from said opening to the lower wall of said rail, said lower portion being offset intermediate said upper and lower walls into engagement with said outer wall.

8. A crate as recited in claim 7 wherein an upwardly projecting integral flange extends along each edge of said bottom, and an inner wall on said side rail extending downwardly from said upper wall into engagement with the inner surface of the flange on said bottom.

9. A crate as recited in claim 8 wherein said lower portion is offset into engagement with the outer surface of said flange.

10. A crate comprising a bottom of sheet material having upturned flanges extending along each side thereof, stacking rails extending along each side of said bottom to support said bottom thereupon, an outer side wall on each of said stacking rails extending upwardly along the outer surface of the associated flange on said bottom, means defining a series of spaced vertical grooves in the inner surface of said flanges, each of said means including a hole extending through said flange and said outer wall from each of said grooves, rod-like side members seated in each of said grooves and projecting upwardly therefrom to define the sides of said crate, each of said side members having its lower end received in the hole in its associated groove, and means securing said lower ends in said holes.

11. A crate having a rectangular bottom of sheet material, stacking elements located below the bottom along each of its sides and secured thereto to support said bottom thereupon, hollow box-like side rail members comprised of walls integral with each of the said stacking elements extending outwardly from the stacking elements, then upwardly, and then downwardly to surround the associated side edge of the rectangular bottom, longitudinally spaced openings in each of the said box-like side rail members, rod-like side members received in said openings, tie members commonly connecting all of said rod-like members to each other to maintain said rod-like members in a vertical position, and means on the lower ends of said rod-like members received within the side rail members and engageable with the interior of the side rail members when the rod-like members are in said vertical position to prevent direct vertical withdrawal of said rod-like members from the openings in said side rail members.

12. A crate comprising a bottom of sheet material, an elongated hollow side rail member secured to and extending along each side edge of the said bottom formed of walls extending in the direction of the said side edge and surrounding an interior hollow space also extending

in the said direction, longitudinally spaced openings in the upper walls of the side rail members, rod-like members extending through the openings into the hollow space, offset lower end portions on the rod-like members engageable with the interior of said side rail members at locations spaced from the sides of said openings, and means secured to the upper portions of said rod-like members for maintaining the offset lower portions thereof in engagement with said locations to prevent withdrawal of said members from said openings.

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