

Aug. 16, 1960

H. REHRIG
MILK CRATE

2,949,207

Filed Sept. 22, 1958

3 Sheets-Sheet 1

Fig. 1

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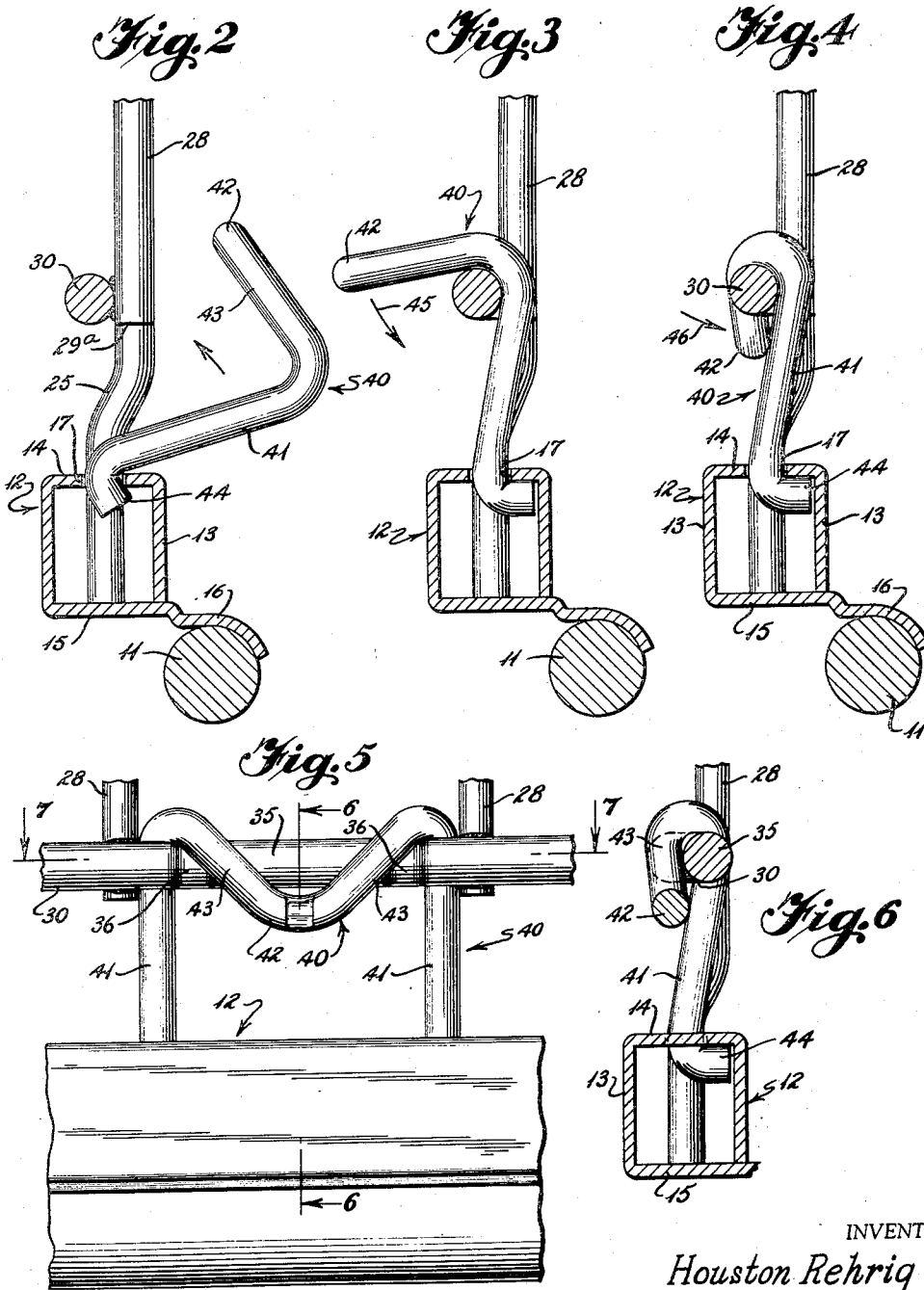
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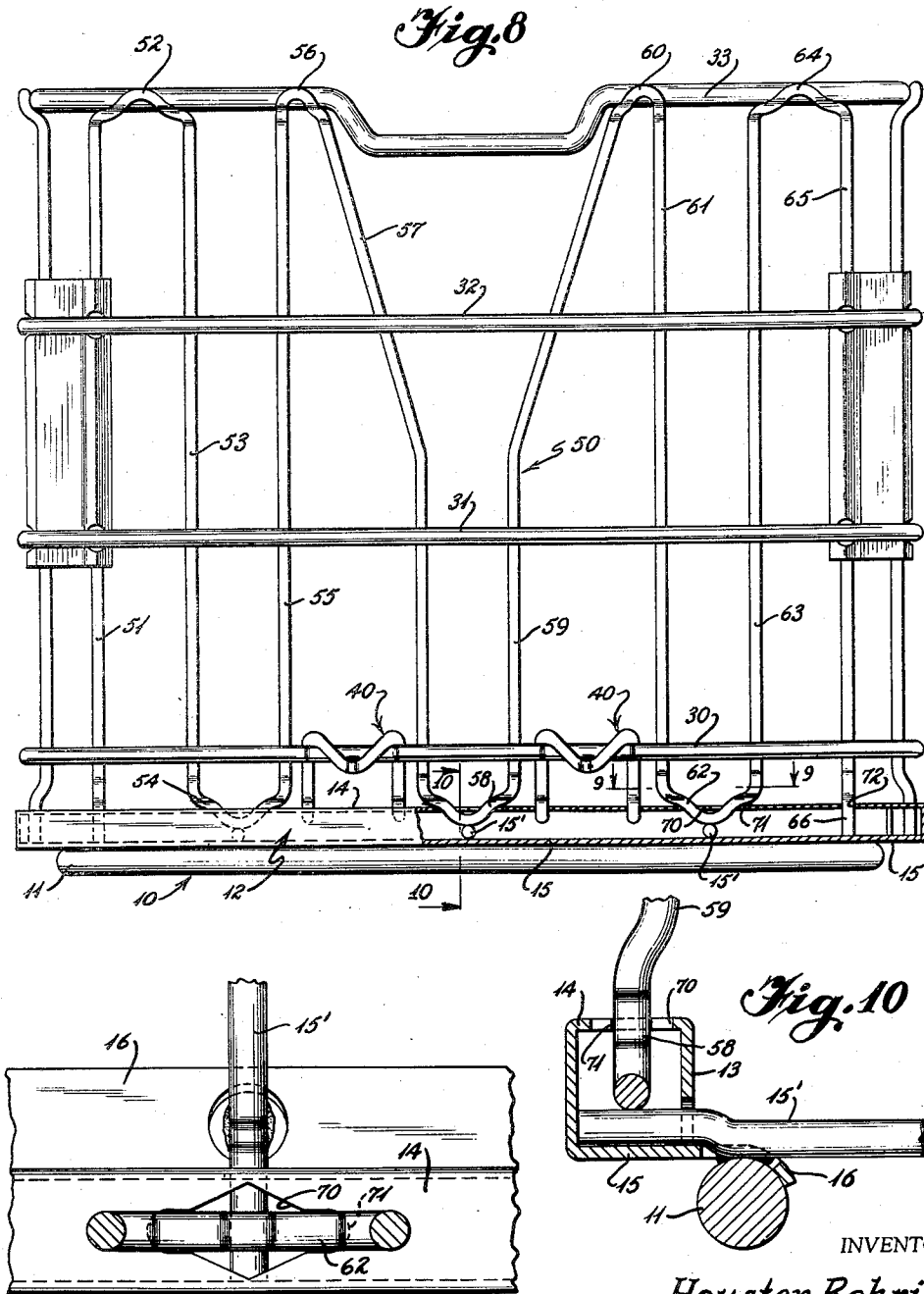
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MILK CRATE

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Filed Sept. 22, 1958, Ser. No. 762,333

10 Claims. (Cl. 220—19)

This invention relates to crates of the type utilized in the handling and delivery of milk and more particularly to a wire milk crate having side walls secured by a clip to a bottom structure.

In the manufacture of wire milk crates and similar crates of this type, it is usually the practice to secure separate wire side walls to the side rails of the crate bottom. These side walls are individually secured to the side rail and are secured to one another by peripheral rods or the like welded to the rods of the side walls to prevent tilting and withdrawal of the side walls from their inserted positions in the side rail. Assembly of such crates is involved in its procedural steps and requires the use of complicated jigs and fixtures to maintain the side walls in their proper alignment during the welding of the peripheral rods.

It is a major object of the present invention to provide a crate with wire side walls which may be assembled to a bottom structure expeditiously and afford a rigid, durable crate structure.

Another important object of this invention is the provision of a crate wherein a completely assembled side wall structure is secured to an assembled bottom wall structure by means of an extraneous securing clip.

In the attainment of these and other objects, an important feature of the invention resides in the arrangement of a crate having wire-type side walls secured to a peripheral side rail by a clip retained on the peripheral side rail and deformed into engagement with one or more of the wire-type sides. More specifically, wire sides of a milk crate project into hollow peripheral side rails where they are retained by clips projecting into the hollow side rails and embracing peripheral rods extending about and secured to the wire sides.

In the production of crates embodying the present invention, it is possible to prefabricate a complete bottom sub-assembly and a complete superstructure sub-assembly, including all four crate side walls, prior to final crate assembly. Final crate assembly is accomplished by the attachment of retaining clips to the bottom peripheral side rail of the complete bottom, the superimposing of the complete superstructure over the side rail, and the deformation of the clips into engagement with elements on the side walls.

Other objects, advantages and features will appear from the following description taken in conjunction with the annexed drawings, in which:

Fig. 1 is a side elevational view illustrating a crate embodying the invention in its preferred form;

Figs. 2-4, inclusive, are detailed views illustrating the assembly of clips which retain the side walls on the side rails;

Fig. 5 is an enlarged fragmentary elevational view illustrating the assembled crate;

Fig. 6 is a sectional view taken along the plane 6—6 of Fig. 5;

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Fig. 7 is a sectional view taken along the plane 7—7 of Fig. 5;

Fig. 8 is a side elevational view of a modified form of crate of the present invention with parts broken away and in section;

Fig. 9 is an enlarged sectional view taken on the plane 9—9 of Fig. 8; and

Fig. 10 is an enlarged sectional view taken on the plane 10—10 of Fig. 8.

As illustrated in the drawings:

A crate bottom 10 has a peripheral stacking rail 11 on its under side and a hollow peripheral side rail 12 extending around its upper margin.

As best indicated in Figs. 2-4, inclusive, the hollow side rail 12 has opposing, parallel, vertical side walls 13 joined by the top wall 14. A bottom wall 15 having bottom wires 15' (Figs. 8-10) underlies the side walls 13 and is provided with a down-turned terminal lip 16 secured to the surface of the stacking rail 11.

Disposed above the bottom assembly is a superstructure 20 comprising a plurality of generally U-shaped side rods 21 each having a pair of vertically extending legs 22 joined by an upper bight portion 23. Lower terminal ends 24 of legs 22 are outwardly offset at 25. In the center of the side wall, side rods 26 have vertically extending legs 28 joined by an upper bight portion 27, with one of the legs 28 terminating in a vertical downwardly extending extremity 29 offset laterally into alignment with ends 24. The other leg 28 terminates, as at 29a, at a level above the laterally offset lower portion 29. Each side wall has similar vertical elements and are secured together by generally horizontally disposed vertically spaced peripheral wires or rods 30, 31 and 32, welded or otherwise secured to the legs 22 and 28 of the vertical wires 21 and 26. At the top of the wide walls is an upper terminal peripheral wire 33, preferably formed of heavier rod stock, to form an upper stacking rail to receive the stacking rail 11 of a superimposed crate. Upper extremities of the side wires 21 and 26 are deflected outwardly so that the bight portions 23 and 27, respectively, lie outside the periphery of the upper rail 33.

The side wall construction illustrated in Fig. 1 may be completely fabricated prior to the assembly with the side rail 12 and the bottom of the crate. Side rail 12 has a plurality of aligned and spaced apertures 17 in register with the vertical lower extremities 24 and 29 of the side wall legs 21 and 26. Lower extremities 24 and 29 are inserted into the apertures 17 and may be bottomed against the lower wall 15 of the side rail as illustrated in Figs. 2-4.

As best illustrated in Figs. 2-7, inclusive, the bottom and superstructure of the crate are secured together by clips 40, with one clip preferably securing each side wall to the bottom wall.

These clips 40 comprise a pair of parallel leg portions 41 (Fig. 5) joined by a central bight or bail portion 42. The bight portion 42 is joined to the legs 41 through intermediate portions 43 originally formed at substantially a right angle to the legs 41. The legs 41 terminate at their lower extremities in terminal projections 44 also lying substantially normal to the legs 41. As best illustrated in Figs. 2, 3 and 4, the leg projections 44 of the clips are initially inserted into the apertures 17 with the legs 41 being turned from their normal vertical position to substantially a horizontal position to accommodate the insertion of the projections 44 into the apertures 17. Then, the clip is turned in a counterclockwise direction (as illustrated in Fig. 4) to superimpose the intermediate leg portions 43 and the bight portion 42 over the lowermost peripheral rod 30 of the

side wall, and the peripheral rail 30 abuts the juncture of leg portions 41 and 43, at which time the clip will assume the position illustrated in Fig. 3 of the drawings. Finally, the clip is deformed in a counterclockwise direction (as seen in Fig. 4) until the intermediate leg portions 43 lie substantially vertical, i.e., substantially parallel to the leg portions 41 and the peripheral rod 30 is clinched within the leg portions of the clip.

This deformation of the bight or bail portion 42 may be carried out by any suitable means, as by a pneumatically or hydraulically actuated cylinder, operating in the general direction of the directional arrows 45 and 46 of Figs. 3 and 4. During such deformation of the bight portion 42 of the clip, the rod 30 may be slightly deformed so depressed central portion 35 is located intermediate the two leg portions 41 and 43 with a curved portion 36 on each side of the portion 35 joining the deformed portion 35 to the remainder of the peripheral rod 30.

In a modified form of the invention illustrated in Figs. 8-10, inclusive, the crate superstructure is composed of side walls 50 formed of a single rod bent into a sinuous pattern which includes a first substantially vertically extending leg 51 joined through an upper bight portion 52 to a second vertical leg 53 generally parallel to the first leg 51 and joined through a lower bight portion 54 to a next vertical leg 55. Leg 55 is formed integrally with upper bight portion 56 joined to a depending vertical leg 57. The side wall illustrated in Fig. 10 is symmetrical about a medial vertical plane, this plane being traversed by a central lower bight portion 58 joining the leg 57 to an identical mirror image leg 59 joined through an upper bight portion 60 to a vertical leg 61 and a bight portion 62 to a vertical leg 63. This leg 63 is joined through an upper bight portion 64 to a terminal depending leg 65 terminating at its lower end in a laterally offset, but vertically extending, terminal portion 66. Each of the upper bight portions 52, 56, 60 and 64 is joined to the upper peripheral rod 33 which is identical to the upper peripheral rod disclosed in connection with the embodiment of Fig. 1.

The lower bight portions are each inserted into the hollow side rail 12 through apertures 70 best illustrated in Figs. 9 and 10 and comprising a central diamond-shaped opening, the longitudinal corners of which are extended, as at 71 to conform to the contour of the rod stock from which the bight portions 54, 58 and 62 are formed. The terminal end 66 of the vertical leg 65 and the corresponding lower terminal end of the vertical reach 51 are inserted through circular apertures 72 formed in the upper wall of the hollow side rail 12. As illustrated in Figs. 8 and 10, the bight portions 54, 58 and 62 are outwardly offset from the plane of the side wall and project into the hollow side rails sufficiently to stabilize the bight portions against displacement relative to the side rails, but an extent less than the free terminal ends 24 and 29 of the rods of the embodiment of Fig. 1. The terminal rod ends 66 project into contact with the bottom wall 15.

Several advantages are obtained from the utilization of the modified side and end wall construction of Figs. 8-10. Initially, it would be noted that a single piece of rod stock is utilized to form the complete side wall, thus simplifying the assembly of the side wall, the upper peripheral rod 33 and the intermediate rods 21-32 and the lower peripheral rod 30. Additionally, it is not necessary to insert into individual apertures in the hollow side rail upper wall 14 the free depending ends of a plurality of individual side wall rods. The converging lateral portions of the lower bight portions 54, 58 and 62 insure the ready insertion of the bight portions into the aperture 70 and the accurate registration of the bight portions in the aperture 70. Assembly of the side walls to the bottom is completed by insertion of clips 40 into the side rail in the same manner as previously described and clinching the clips 40 around the peripheral rod 30.

It will be readily appreciated that the present invention permits the superstructure and the bottom to be completely prefabricated before assembly. Assembly of the side and bottom completes the fabrication of the crate with clips 40 securing them in a rigid, durable construction.

While preferred embodiments have been described above in detail it will be understood that numerous modifications might be resorted to without departing from the scope of the invention as defined in the following claims.

What is claimed is:

1. A crate comprising a hollow side rail and a side wall seated upon said side rail and having an aperture therein, and a securing clip having a first portion extending through said aperture and clinched downwardly against one side of said side wall, and a leg portion extending downwardly along the opposite side of said side wall and projecting downwardly into said side rail, said leg having a lower terminal projection angularly related to said leg portion and confined within said side rail.

2. In a crate having a hollow side rail in which a pair of spaced apertures communicate with the interior of said side rail, an upper crate side including a plurality of vertical rods having their lower ends seated in said side rail, and a peripheral rod secured to said vertical rods to lie parallel to said side rail in spaced relation thereto; a securing clip comprising a substantially U-shaped rod having depending ends projecting through said side rail apertures into the interior of said side rail, offset portions on said depending ends contacting an interior surface of said side rail, said U-shaped rod having an upper loop clenched over said peripheral rod to maintain said upper crate side in seated engagement with said side rail.

3. A crate comprising a hollow side rail, a crate superstructure seated on said hollow side rail, securing elements comprising individual clips formed of rod-like stock having substantially vertical legs joined by an integral central bail portion initially lying substantially normal to the legs, each of said legs terminating in projections also lying substantially normal to said legs, said projections being disposed interiorly of the side rails to prevent vertical side rail-clip separation, said bail portion being deformed into substantial parallelism with said legs to clinch said crate superstructure into seated engagement with said side rail.

4. A crate comprising a hollow side rail having a pair of spaced apertures communicating with the interior of said side rail, a side wall seated upon said side rail and including a peripheral rod parallel to said side rail and spaced thereabove, a securing clip comprising a substantially U-shaped rod having free ends projecting through said apertures into the interior of said side rail and terminating in projections lying substantially normal to said legs and contacting an interior surface of said side rail to prevent vertical withdrawal of said clip through said apertures, said U-shaped rod having a central bight portion overlying said peripheral rod and extending downwardly therefrom toward said side rail to confine said peripheral rod between said bight portion and said legs and maintain said side wall seated upon said rail.

5. A crate comprising a side rail, a superstructure seated on said side rail and having side walls generally vertically aligned with said side rail, said side walls each comprising a single length of rod having vertical reaches joined by alternate upper and lower bight portions and a horizontal rod secured to and interconnecting said vertical reaches, said side rail having means thereon defining seats receiving the lower side wall bight portions, and securing clips on said side rail clinched over said horizontal rod intermediate a pair of said lower bight portions to secure said side walls to said rail with said lower bight portions seated in said side rail sections.

6. In a crate having a bottom, a side rail having a

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horizontal wall thereon secured to and extending along one side of said bottom, said horizontal wall having a pair of openings therethrough, a side wall supported upon said side rail, a horizontal rod secured to said side wall and extending along said side wall above said horizontal wall, a U-shaped wire clip having a pair of legs passing downwardly through said openings, an offset end portion on each of said legs engaged beneath said horizontal wall to prevent vertical withdrawal of said clip from said rail, and an integral bight portion on said clip interconnecting said legs and bent downwardly over said horizontal rod to vertically clamp said side wall into seated engagement with said side rail.

7. In a crate having a bottom, a hollow side rail having a horizontal wall thereon secured to and extending along one side of said bottom, said horizontal wall having a pair of openings therethrough, a crate side wall including a plurality of vertically extending rod-like members and a horizontal rod member interconnected to said vertical members and extending transversely thereacross adjacent the lower end of said wall, means on said side rail defining a seat adapted to receive and support said vertical members of said side wall, a U-shaped wire clip having a pair of legs passing downwardly through said openings, an offset end portion on each of said legs engaged beneath said horizontal wall to prevent vertical withdrawal of said clip from said rail, and an integral bight portion on said clip interconnecting said legs and bent downwardly over said horizontal rod to vertically clamp said side wall into seated engagement with said side rail.

8. In a crate as defined in claim 7, said side rail having a second integral horizontal wall spaced below the first mentioned horizontal wall, said seat defining means on said side rail comprising a plurality of apertures through the first mentioned horizontal wall receiving the lower

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ends of said vertical side wall members, the lower ends of said side wall members being seated upon said second horizontal wall on said rail.

9. In a crate as defined in claim 7, said offset end portions of the legs of said clip being offset to pass from said openings inwardly of said crate in a direction normal to the general plane of said wall, said legs projecting upwardly to pass the inner side of said horizontal rod and said bight portion of said clip being located at the outer side of said horizontal rod.

10. In a crate as defined in claim 7, said horizontal wall of said side rail having a plurality of apertures therethrough elongated longitudinally of said side of said bottom, said side wall comprising a first rod member formed into a series of vertical reaches joined by alternate upper and lower bight portions, and a horizontal rod secured to and interconnecting said vertical reaches, said elongated apertures in said side rail being adapted to receive the lower bight portions of said side wall to define a seat therefor.

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