Feb. 21, 1939. H. S. LION ET AL 2,148,027

MILK CRATE CORNER ASSEMBLY

Filed Oct. 16, 1934 2 Sheets-Sheet 1

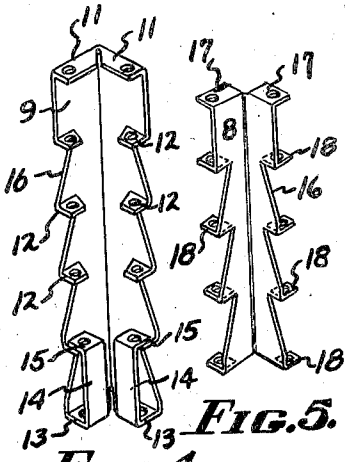


FIG. 4.

FIG. 5.

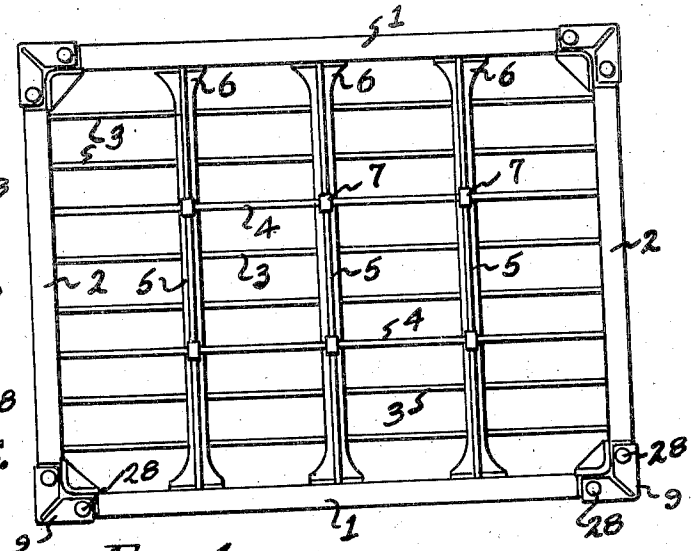


FIG. 1.

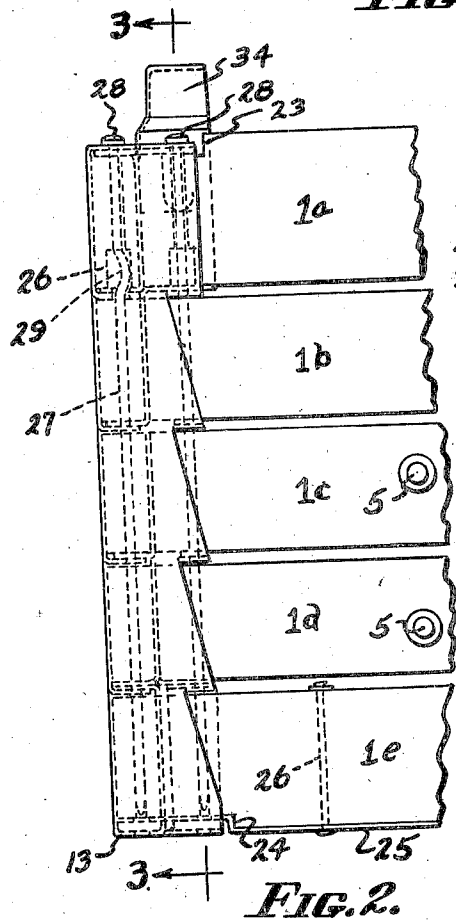


FIG. 2.

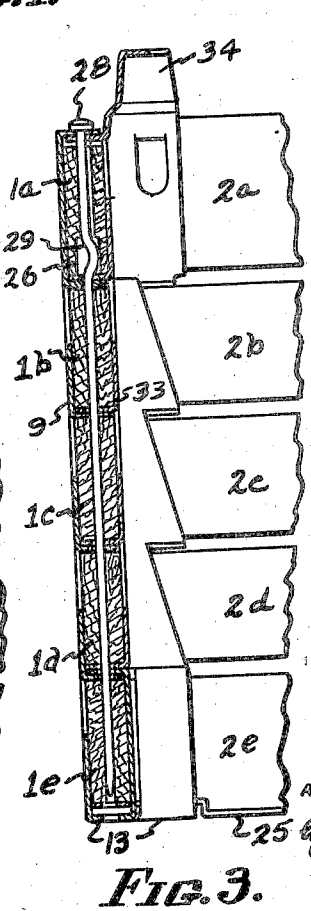


FIG. 3.

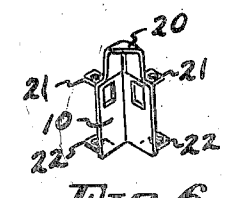


FIG. 6.

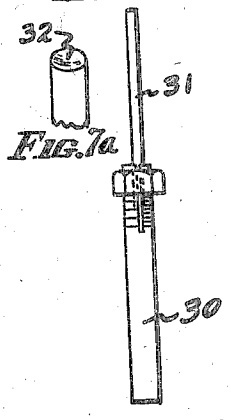


FIG. 7a.

FIG. 7.

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MILK CRATE CORNER ASSEMBLY

Filed Oct. 16, 1934 2 Sheets-Sheet 2

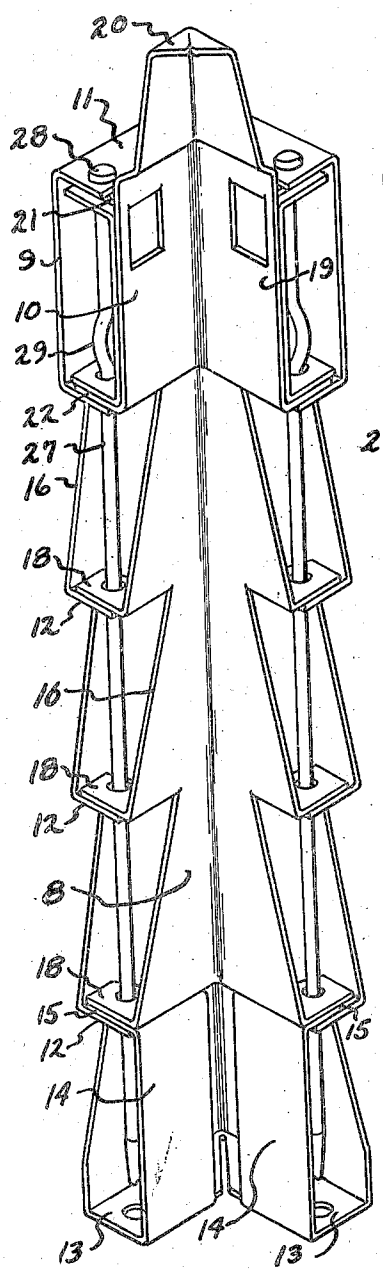


FIG. 8.

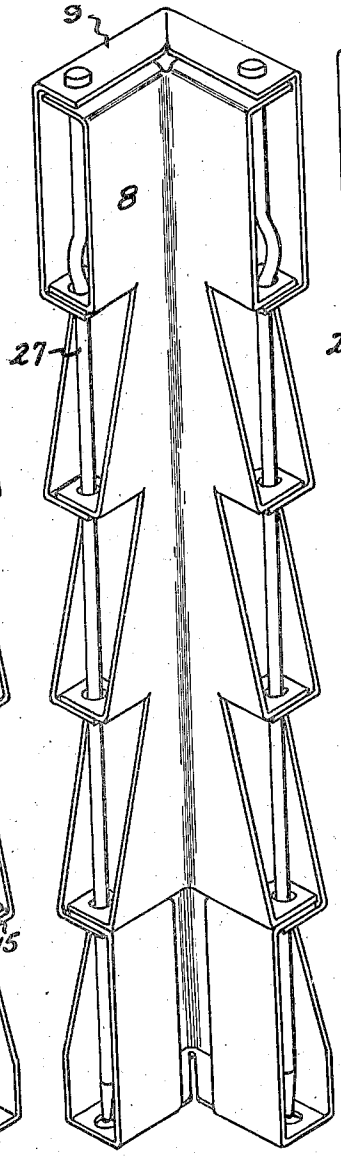


FIG. 9.

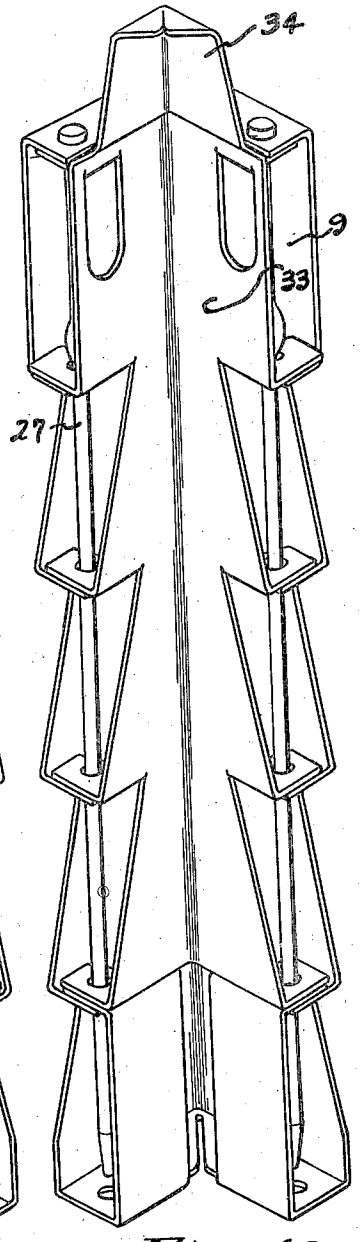


FIG. 10.

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UNITED STATES PATENT OFFICE

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MILK CRATE CORNER ASSEMBLY

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Application October 16, 1934, Serial No. 748,535

16 Claims. (Cl. 217—65)

In a copending application we have described a novel construction of inner and outer corner irons and a novel, readily removable fastening means. Preferably our present invention is employed in such a construction, though not limited thereto. Our present invention is, indeed, not necessarily limited to a crate of the slatted or railed type, nor to a crate having corner irons; but for the purpose of an exemplary disclosure, will be described in connection with such a crate.

Our invention has to do with a stacking iron construction primarily. Stacking irons are those members in a milk crate which have portions projecting above the general level of the tops of the side and end walls of the crate, which portions are adapted to engage within the side and end walls of another crate placed upon the first, so that crates may be stacked one on another without danger of accidental horizontal dislodgment. These stacking irons are placed at the corners of the crates. They are usually angularly shaped stampings of sheet metal with offset stacking extensions. Hitherto it has been the practice either to rivet such members to the walls of solid walled crates, or to form stacking extensions integral with the inner corner irons of crates of the slatted type, which inner corner irons are usually themselves riveted to the walls of the crate. Either of these expedients has made it very difficult to repair a crate which has been damaged as to the stacking irons, and such damage frequently occurs in the use of the crates.

The primary objects of our invention are the provision of a corner iron construction which is easily repaired or replaced and the provision of a novel corner construction in milk crates, including the stacking iron element, which is exceptionally strong but easily disassembled.

These and other objects of our invention which will be set forth hereinafter or will be apparent to one skilled in the art upon reading these specifications, we accomplish by that certain construction and arrangement of parts of which we shall describe the aforesaid exemplary embodiment, reference being had to the accompanying drawings, wherein:

Figure 1 is a plan view of a milk crate embodying our invention.

Fig. 2 is an elevational view of a corner thereof.

Fig. 3 is a sectional view taken along the lines 3—3 of Fig. 2.

Fig. 4 is a perspective view of an outer corner iron.

Fig. 5 is a perspective view of an inner corner iron.

Fig. 6 is a perspective view of a stacking iron.

Fig. 7 shows a tool for removing the locking rods.

Figure 7a is an enlarged view of the upper end of said tool.

Fig. 8 shows a form of corner construction with a stacking iron separate from the inner corner iron.

Fig. 9 shows a corner construction in which the stacking iron is omitted.

Fig. 10 shows a corner construction in which the stacking iron is integral with a partial inner corner iron, extending to the top of the bottom slat.

Briefly, in the practice of our invention we provide a stacking iron having ears adapted to project into the walls, or to extend above and below, or in the interstices between one or more slats in adjacent walls at the corner. The ears and slats are perforated, and members passing through the perforations hold the stacking iron to the crate. In one particular embodiment described, inner and outer corner irons are employed having ears lying between the slats. Rods on each side of the corner pass through the slats, the ears of the corner irons, and the ears of the stacking iron, and form the fastening means at the corners of the crate. These rods are readily removable when repairs or replacements are to be made, as rendered possible by a construction hereinafter to be described. In another embodiment of our invention we have shown a form of corner construction in which a stacking iron forms a portion at least of the interior of the inner corner iron, as will hereinafter be more fully described.

The general assembly of an exemplary crate is shown in Figure 1, where the sides are indicated at 1 and the ends at 2. Longitudinal bottom forming rods are shown at 3, and longitudinal and transverse partition forming rods at 4 and 5. Bottom strut members are shown at 6, and arms 7 connect the partition rods at their crossing points and have an operative relationship with the bottom structure. The interior rodded or other construction of the crate, however, has no necessary bearing upon our invention, and will not be further described.

Reference to Figs. 2 and 3 will show that the sides and ends of our crate are formed of slats 1a, etc., and 2a, etc., respectively. Inner and outer corner irons are shown at 8 and 9. A stacking iron is shown at 10. The inner and outer corner iron members are of generally rectangular cross section, and will be described in some detail.

The outer corner iron **9** has portions bent over at the top as shown at **11**. Ears **12** are bent up normal to the side walls of the corner iron at intervals. These ears are perforated for a purpose hereinafter to be described, and are intended to cooperate with the ears on the inner corner iron to lie above, below and between each pair of slats or rails in the sides and ends of the box and to act as spacers therefor. The bottom portions of the outer corner iron are bent over to form bottom shoe members **13** and then are continued upwardly to form interspaced members **14** which terminate in perforated, bent over ears **15**. The portions of the side walls of both corner irons between the ears are preferably beveled as at **16** excepting at the top, as shown.

The inner corner iron is likewise of angular formation, having top ears **17**, and other ears **18** interspaced therefrom. Whereas in the outer corner iron the ears are bent over inwardly, in the inner corner iron they are bent over outwardly, so that when the irons are assembled with the ends of the slats or rails therebetween the ears and the perforations therein may be aligned with each other and with perforations in the slats or rails. By reason of the portions **14** of the outer corner iron the inner corner iron does not need to be as long.

In the embodiment of our invention shown in Figs. 2, 3, and 10 instead of making the stacking means integral with either of the corner irons, we form it as a separate piece. This is a member of generally angular cross section having a body (Fig. 6) and a stacking extension **20**. This extension is reduced, and offset from the body, and is of the usual shape to permit its engagement within the bottom shoes of an overlying crate when the crates are stacked. Upper and lower ears **21** and **22** are struck up outwardly from the body of the stacking iron, and are perforated. They are of a size and shape adapted to permit their alignment with the ears on the inner and outer corner irons as clearly shown in Figs. 2 and 3. Both the corner and the stacking irons are preferably formed as sheet metal stampings, galvanized or otherwise protected from corrosion.

In the embodiment of the invention shown in Fig. 10 the stacking iron is formed integrally with an inner corner member designated as **33**, of a shape generally similar to the inner corner iron illustrated in Fig. 5, excepting for a stacking extension indicated at **34**. We are able to use a stacking iron of this type economically because of the construction of our crate permitting ready disassembly of the corner structure and replacement thereof. Where the stacking extension **34** is to be integral with an inner corner iron **33**, the member **33** is preferably made of a heavier gauge of metal than is necessary in the formation of an inner corner iron such as that shown in Fig. 5.

In assembling the crate the slats or rails go between the inner and outer corner irons. The ends of the upper rails are notched out as at **23** to bring the top ears of the corner irons substantially into the plane of the top of the crate. The lower rails or slats are also notched out as at **24** to bring the shoe portions **13** of the outer corner irons to the level of the bottom of the crate, and further, to accommodate the offset end of a shoe strip **25** which underlies each bottom rail and which may be riveted thereto, as at **26**. The stacking irons are added to the assembly with their ears in alignment with the ears of the outer and inner corner irons. When the parts have been put together in this way, assemblies of ears underlie and overlie each rail or slat, and act as supports and as ultimate spacers therefor. Perforations in the several metal members and in the slats or rails are brought into alignment, and the crate may be fastened together with rod means to be described hereinafter.

The perforations in the top rails or slats are somewhat larger than the perforations in the other rails, and also have still further enlarged portions indicated at **26**. Rod members **27**, which are preferably long enough to extend from the top almost to the bottom of the crate, but are in no event longer than the crate is high, are provided with heads **28**, and crooks or shoulders **29**. They may be provided with enlargements otherwise formed, or with other locking means. These rod members may be driven through the aligned perforations to complete the crate. When they are so driven, the crook **29** in the rods compresses as it passes through the perforation in the top rails, but expands into the enlargement **26** of the perforation locking the rods against dislodgment. The crate, or any corner portion thereof, however, is easily disassembled for repair or replacement either of a corner iron, a stacking iron, or the rails themselves, by merely driving out the rods **27** until the crooks therein have come above the upper ears. This is conveniently done by means of a tool such as that shown in Fig. 7, having a handle and driving head **30**, and a shank **31** of about the same size as the rod.

In Figure 7*a* I have shown an enlarged perspective view of the upper end of the driving tool showing a cup-shaped formation **32**, the purpose of which is to form a positive engagement with the tapered or pointed, or otherwise reduced ends of the rod members **27**. The shank of this tool is inserted through the perforations in the shoe members of the corner irons, and when it contacts the end of the rod, is tapped with a hammer until the rod has been driven far enough out to free the crook therein as aforesaid. After this the rod may be easily withdrawn by the fingers for the remainder of the way. When a new part has replaced the old, the crate is reassembled by reinsertion of the rod. There will, as shown, be two of the rods at each corner of the crate. Figure 8 shows a corner assembly with separate stacking iron. Figure 9 shows a corner assembly without a stacking iron.

It will be understood that modifications may be made in our invention without departing from the spirit thereof.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In a crate the combination of inner and outer corner irons, slats forming a side and end wall having their ends between said corner irons, ears on said corner irons extending between said slats, and continuous perforations through said ears and slats, a stacking iron having an angular body and ears projecting outwardly therefrom and adapted also to extend between said slats, said ears being perforated in alignment with said continuous perforations, and members passing through said perforations and adapted to hold said several structures in assembly.

2. In a crate the combination of inner and outer corner irons, slats forming a side and end wall having their ends between said corner irons, ears on said corner irons extending between said slats, and continuous perforations through said ears and slats, a stacking iron having an angular body and ears projecting outwardly therefrom

and adapted also to extend between said slats, said ears being perforated in alignment with said continuous perforations, and members passing through said perforations and adapted to hold said several structures in assembly, there being a plurality of said ears on said body interspaced along each side edge thereof.

3. In combination in a crate, a corner reinforcement member, slats forming a wall of said crate, ears on said member entering in between said slats, a continuous perforation extending through said ears and said slats, a rod in said continuous perforation extending substantially the full length thereof, and a stacking iron having perforated ears also extending between said slats, said stacking iron being held in position by said rods.

4. In combination in a crate, a corner reinforcement member, slats forming a wall of said crate, ears on said member entering in between said slats, a continuous perforation extending through said ears and said slats, a stiff rod in said continuous perforation extending substantially the full length thereof, and releasable means for holding said rod in said perforation, said means comprising a sidewise extending abutment in said rod and a cooperating abutment in said perforation, and a stacking iron having perforated ears also extending between and above said slats, said stacking iron being held in position by said rods.

5. In combination in a slatted crate, a corner reinforcement member of angular shape having ears adapted to lie above and between the slats, bottom portions of said member being bent over inwardly so as to enclose the ends of the bottom slats, at least, upon three sides, slats forming a side and end wall of a crate, continuous perforations extending through said ears, said slats and said bottom portions, rods in said continuous perforations extending substantially the full length thereof, and a stacking iron having perforated ears also extending above and between said slats, said stacking iron being held in position by said rods.

6. In combination in a slatted crate, a corner reinforcement member of angular shape having ears adapted to lie between the slats, bottom portions of said member being bent over inwardly so as to enclose the ends of the bottom slats, at least, upon three sides, slats forming a side and end wall of a crate, continuous perforations extending through said ears, said slats and said bottom portions, and rods in said continuous perforations extending substantially the full length thereof, said means comprising sidewise extending abutments in said rods and cooperating abutments in said perforations, and a stacking iron having perforated ears also extending between said slats, said stacking iron being held in position by said rods.

7. In a crate of the character described, side and end walls forming a corner, and a stacking iron having an angular body fitting within said corner and extending substantially the full depth of said crate, and a stacking extension rising thereabove, means extending substantially the full depth of said crate for holding the walls of said crate together at said corner, said means being the sole fastening means for said corner iron.

8. In combination in a crate, wall members coming together to form a corner, a corner reinforcement member and a stacking iron, said corner reinforcement member and said stacking iron having cooperating extensions entering into said walls, and continuous perforations through said wall and said members whereby a fastening means in each wall may be employed as the sole securing means for the walls to form the corner and for the stacking iron to hold it in place.

9. In combination, a side and end wall of a crate coming together to form a corner, an outer corner reinforcement member having portions extending into said walls and a stacking iron member adapted to fit in the interior of said corner, and also having members extending within said wall and readily removable fastening means for holding said several parts in combination.

10. In combination, a side and end wall of a crate coming together to form a corner, an outer corner reinforcement member having portions extending into said walls and a stacking iron member adapted to fit in the interior of said corner, and also having members extending within said wall and readily removable fastening means for holding said several parts in combination, said stacking iron having an angular body extending within said corner having substantial depth so as to form an inner corner reinforcement member.

11. In combination, a side and end wall of a crate coming together to form a corner, an outer corner reinforcement member having portions extending into said walls and a stacking iron member adapted to fit in the interior of said corner, and also having members extending within said wall and readily removable fastening means for holding said several parts in combination, said outer corner reinforcement member being bent over at the bottom and extended up interiorly of said corner so as to form a bottom shoe and a portion of an interior corner reinforcement member.

12. In combination in a slatted crate, inner and outer corner irons having cooperating pairs of ears adapted to lie between the slats, slats forming side and end walls of a crate, continuous perforations extending through said slats and ears, and rods in said continuous perforations extending substantially the full length thereof, the bottom portions of said outer corner iron being bent over inwardly to form shoes and portions lying within at least the bottom slats of said walls, and a stacking iron having perforated ears also extending between said slats, said stacking iron being held in position by said rods.

13. In a milk crate, wall members, corner reinforcement means extending substantially the full depth of said crate, readily detachable means for holding said members and means in assembly, and a seperate stacking iron, said detachable means serving to hold said stacking iron also in assembly with the aforementioned members and means.

14. A crate comprising four walls arranged in rectangular relation, a corner iron at each corner of the crate formed at its upper end to extend over the upper edge of the crate, a stacking iron at each corner of the crate positioned to overlie the upper end of the corresponding corner iron and the upper edge of the crate, and attaching means passing vertically through each stacking iron, the corresponding corner iron and into the underlying walls of the crate to anchor the stacking iron to the walls of the crate and simultaneously secure the walls of the crate to the corner irons.

15. A bottle crate comprising four walls, each of which is composed of superimposed slats, a

stacking iron at the top of each of the four corners of the crate, and tie rods extending vertically through the superimposed slats of each wall adjacent each of the four corners of the crate and through the superimposed stacking irons to secure said slats together and to the stacking irons.

16. A bottle crate comprising four walls, each comprising superimposed slats, corner irons at the four corners of the crate formed to overlie the upper and lower edges of the crate, tie rods extending vertically through the slats adjacent the four corners of the crate and through the corner irons to secure said slats to the corner irons, and stacking irons at the top of the crate and at the four corners thereof, said stacking irons being anchored to the crate by said tie rods.

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