

Feb. 13, 1951

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STEEL BOTTLE CONTAINER

2,541,972

Filed Jan. 27, 1948

2 Sheets-Sheet 1

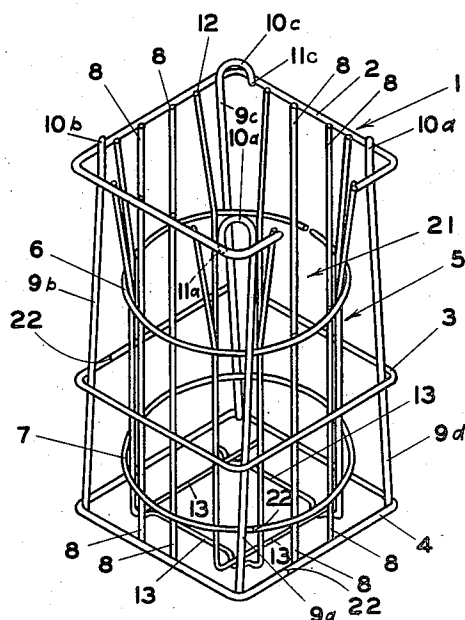
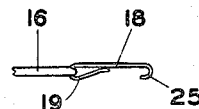
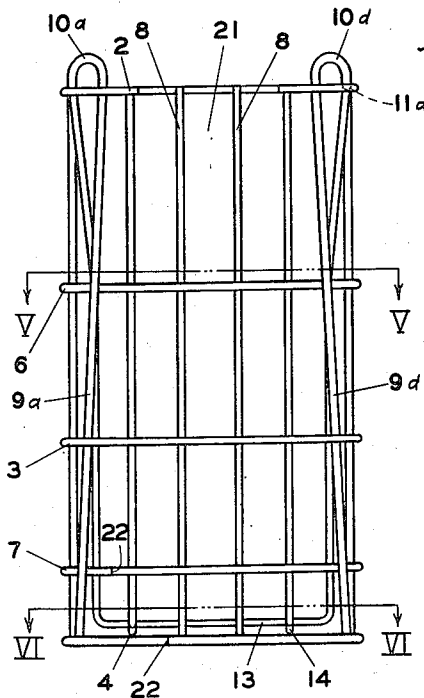
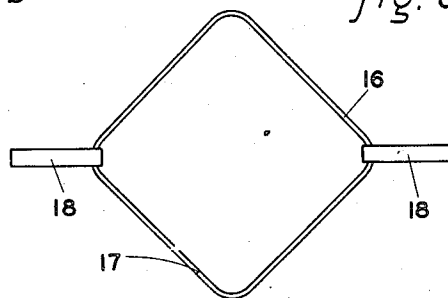


fig. 2

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UNITED STATES PATENT OFFICE

2,541,972

STEEL BOTTLE CONTAINER

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Application January 27, 1948, Serial No. 4,543

3 Claims. (Cl. 220—19)

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This invention relates to carboy bottle crates and more particularly to such a crate constructed of metallic rods.

In the field of transporting and storing liquid materials, especially corrosive chemicals, it has heretofore been found most satisfactory to use glass bottles having a capacity of five or more gallons. By reason of their shape and breakable nature these bottles must be enclosed in some type of crate both for protection and to effect ease in handling.

In designing such a crate several paramount characteristics have been the objectives of those acquainted with the problems in this field, among which objectives have been to provide a light weight crate, compact in size, while providing adequate protection for the fragile bottle and of such a shape that it occupies the least area in the usual storage spaces. In addition to these features it must be capable of developing sufficient overall structural strength to withstand heavy loads and rough handling, which requirement is complicated by the fact that many crates are often stacked one on top of the other imposing high compressive loads. Further, these crates must be designed such that when stacked the resulting vertical tier is stable, since the nature of the chemicals often makes the failure of a crate extra hazardous to nearby personnel. My invention provides means which not only positively align vertically each of the crates in such a stack but also prevents them from shifting out of such alignment even though the entire stack is swayed. Furthermore an economy of weight has been accomplished by combining the aligning means with a hook for lifting the crates. The hook has been so constructed that the loads imposed upon the crate by means of this hook when the crate is thus lifted are distributed evenly throughout the entire structure, eliminating distortion and ultimate failure due to load concentrations heretofore unavoidable in existing designs.

Previously existing bottle crate designs utilizing rod material for its primary structure have failed to provide adequate vertical and lateral support for the bottle. In providing such support it is necessary to devise a structure whereby the support is applied to a large number of areas on the bottle in relatively even distribution over its surface. I have accomplished this by placing the vertical rods inside all of the horizontal members and in direct contact with the bottle. Further, the bottom support for the bottle and the vertical rods have been integrated into a sin-

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gle supporting unit. This has strengthened the structure by eliminating unnecessary joints and shortening the length of the lower support members to provide the vertical support therefor proximate to the bottle itself, or as near as possible to the center of load.

The placing of the rods inside the horizontal members has a further advantage in that it permits the horizontal members to be superimposed vertically, thereby providing a crate of greater structural strength and rigidity, yet more compact and thus more economical to store and transport. All of these improvements have combined to produce a crate having a greater operating life and having a greatly increased safety factor.

Therefore, a primary object of this invention is to provide a bottle crate having a positive gripping means combined with an interlockable lug for stacking purposes.

A further object of my invention is to provide a bottle crate having a bottle supporting floor which will not materially deflect under vertical loads.

A still further object of my invention is to provide a bottle crate giving positive support to the bottle in a large number of places.

An additional object of my invention is to provide such a bottle crate having means to distribute the load from the gripping lugs throughout the entire crate.

Still another object of my invention is to provide a bottle retaining means which cannot become detached in service but which may be easily and swiftly removed when so desired.

Other objects and purposes of my invention will be apparent to those acquainted with articles of this type upon inspection of the following specification with reference to the accompanying drawings.

Figure 1 is an oblique view of my invention.

Figure 2 is a front elevational view of my invention.

Figure 3 is a side elevational view of my invention.

Figure 4 is a top view of my invention.

Figure 5 is a sectional view of my invention taken along the plane V—V of Figure 2.

Figure 6 is a sectional view of my invention taken along the plane VI—VI of Figure 2.

Figure 7 is a detail view of the bottle retainer of my invention.

Figure 8 is a fragmentary side elevational view of my bottle retainer showing the fastening means.

In providing a structure for executing the ob-

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jects and purposes of my invention, I have designed a bottle crate having top, bottom and intermediate exterior frame members circumscribing a circular bottle nesting frame, the vertical members of which are placed inside ring-shaped members in direct contact with the bottle and a number of which are bent to form a floor for the bottle nesting frame.

In the following description the words "upper" and "lower" are freely used and are to be taken to means in relation to the bottle crate as seen in Figure 2. The words "interior" and "exterior" are also freely used and are to be taken to mean interiorly towards the geometric center of the crate and exteriorly away therefrom.

Referring specifically to the drawings, the numeral 1 indicates an exterior housing having a top frame 2, an intermediate frame 3, and a bottom frame 4. An interior housing 5 consisting of an upper ring-shaped member 6, a lower ring-shaped member 7 and straight vertical members 8 is seated within the exterior housing 1 in such a manner that a portion of the interior surfaces of the ring-shaped members 6 and 7 are vertically aligned with a portion of the interior surfaces of the frame members 2, 3 and 4. The straight vertical members 8 are located only at the points where the inside surfaces of the ring-shaped members and the frame members are in exact vertical alignment. The intermediate frame 3, bottom frame 4 and the lower ring-shaped member 7 are each formed into a rigid unit by butt welding 22 or other suitable joining means. A portion of one side of the upper frame 2 is removed and the ends 23 of the upper ring-shaped member 6 are not joined for reasons which will appear more fully hereafter.

The top frame 2, intermediate frame 3, and the bottom frame 4 are each formed in the shape of a square with rounded corners. A vertical support 9a is welded to the inner surface of the bottom frame 4 at one corner thereof and extends upwardly at an inclined angle until it contacts the inner surface of the top frame 2 at a point spaced away from the corner, at which point it is formed into a loop 10a projecting upwardly from the top frame 2 several inches. The loop 10a is so formed that it extends across the inside of the frame corner at an angle of substantially 45 degrees to the sides of the frame and the ends 11a of the loops are welded to the frame at their point of contact.

The vertical support 9a is welded to the intermediate frame 3 and the top frame 2 at their respective points of contact. Similar vertical supports 9b, 9c and 9d and similar loops 10b, 10c and 10d with corresponding ends 11b, 11c and 11d are provided at each of the other four corners of the exterior housing 1.

The straight vertical members 8 of the interior housing 5 are welded to the interior surfaces of the frame members 2, 3 and 4 and to the interior surfaces of the ring-shaped members 6 and 7 and are spaced apart approximately one sixth of the width of a side of one of the frame members.

Between the vertical members 8 and the corners of the top frame 2, four tie elements 12 are provided welded to the interior surfaces of the top frame 2 and extending inwardly and downwardly to pass within the ring-shaped members 6 and 7 to which they are welded. At their lower ends, which are points above the lower surface of the bottom frame 4, the tie elements 12 are

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each bent through approximately a 90 degree arc to form floor members 13 for the interior housing 5. After forming the floor members 13, the tie elements 12 are bent to extend upwardly again to the top frame 2 and are again welded to the interior surfaces of the ring-shaped members 6 and 7 and the top frame 2. Each tie element 12, thus, is shaped into a flat bottomed U having the upper portion of its sides flared outwardly and with the bottom of the U formed by the floor members 13.

Two of the floor members 13 are provided with joggled portions 14 to permit the passage of the other two floor members at their intersection point 15 while maintaining a level upper surface (Figure 3). The floor members are welded together at each of the intersections 15.

The bottle retainer 16 consists of a rod bent to form a square, and butt welded at 17 or otherwise suitably joined into a rigid unit (Figures 3, 7 and 8). A catch 18 is pivotally fastened to each of the opposite corners of the retainer. Each of the catches 18 is fastened to the retainer 16 by a loop 19 formed around the retainer and pressed against the body of the catch sufficiently to prevent detachment (Figure 8). The end of the loop 19 may be spot welded or riveted if desired.

One side of the crate is provided with an opening 21 (Figs. 1 and 2) created by eliminating the portion of the top frame 2 between the tie elements 12 and the vertical members 8 above the upper retaining ring 6. The purpose of this opening will appear more fully hereafter.

The various portions and members of the crate are preferably constructed from steel rod material because of its strength, durability and excellent welding characteristics. Other materials, however, may be used where the circumstances dictate that such should be done. The various parts of the crate may be protected by a suitable coating such as parkerizing or spraying with enamel.

Operation

The bottle 24 is inserted in the crate by seating it within the central opening or basket provided by the interior housing 5 (Fig. 1). This interior housing is so formed that the bottle fits snugly within the space and is held against lateral movement by the vertical members 8 and the tie elements 12 which contact the sides of the bottle. The floor members 13 support the bottle vertically. When the bottle has thus been seated the retainer 16 is placed around the tapering portion of the bottle 24 with one of the catches 18 attached to the upper ring-shaped member 6 by engagement of the hook 20. The ring-shaped member 6 is then sprung together to permit the hook 25 on the other catch 18 to be slipped over it and upon release the ring-shaped member returns to its normal position thereby tightly engaging the hook 25. The gap between the ends 23 of the ring-shaped member 6 is provided for the express purpose of permitting the ring-shaped member to be sprung together to facilitate engagement of the hooks 25. A simple and easy method of locking the bottle into place is thus provided which is at the same time a positive engagement against becoming unlocked. If the bottle tends to slide toward what is normally the top of the crate the resulting pull on the retainer will cause the hooks to more firmly engage the ring-shaped member 6 thereby assuring a constant lock.

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By making the floor members 13 and the tie members 12 from a single piece of material by a bending operation, a floor is provided for the bottle which is supported directly at the sides of the bottle, eliminating the bending created by extending these floor members outwardly to the lower frame. The tendency of the floor members to deflect and ultimately fail due to these bending loads is thereby eliminated.

The loops 10 serve the dual purpose of aligning the crates when they are stacked and providing an easy means for grasping the crate when it is to be moved. As a means for lifting the crates they serve either as easily accessible handles or a place to attach a crane hook or similar device. Their size makes the operation simple and assures a complete engagement.

As aligning means in stacking, the loops 10 on the lower crate extend up into the corners of the bottom frame of the crate above. Since the top and bottom frame members have the same inside dimensions these loops will slidably engage the interior surfaces of the bottom frame of the upper crate and assure the resting of the bottom frame of the upper crate squarely on the top frame of the lower crate and thereafter prevent relative lateral displacement between the crates. Their height is sufficient to prevent such lateral movement even though the stack is for some reason deviated from the vertical. The vertical supports 9 absorb the load imposed through the loops 10 and distribute it throughout the entire crate by passing it into the frame members 2, 3 and 4. Being almost vertical they serve as primary structural elements under both tension and compression loads.

The opening 21 in the side of the exterior housing 1 aids in permitting the ring-shaped member 6 to have built-in resiliency but more importantly it provides an opening through which the contents of the bottle may be poured when the crate is laid on its side. Thus the bottle may be emptied without removal from the crate and without danger of spilling any of the contents on the framework of the crate.

Various modifications of this described construction will be immediately apparent to persons acquainted with equipment of this type and accordingly the hereinafter appended claims should be interpreted to cover such modifications and variations excepting as said claims by their own terms expressly require otherwise.

I claim:

1. A protective crate for a bottle comprising: a plurality of substantially square, horizontally disposed frame members one of which forms the top of said crate and one of which forms the bottom of said crate, a plurality of horizontally disposed ring-shaped members vertically spaced between said frame members and having a portion of their inside surfaces in the same vertical plane as a portion of the inside surfaces of said frame members the upper of said ring-shaped members being broken and having its ends spaced apart a short distance, a plurality of straight vertical rods attached to the inside surface of said frame members and said ring-shaped members, a

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plurality of rods each constituting as a unit a pair of vertical stays and a floor member, attached to the inside surface of said top frame member and ring-shaped members and as a group forming a closely fitting bottle supporting basket, a substantially vertical support attached to the inside surface of each of said frame members at their corners and projecting above said top frame member to form a loop thereabove, the end of said loop attached to said top frame member, a bottle retainer adapted for seating over a portion of said bottle and having a pair of catches detachably engaging said upper ring-shaped member and held against disengagement by resiliency within said upper ring-shaped member.

2. A protective crate for a bottle comprising: a plurality of substantially square, horizontally disposed frame members, one of which forms the top of said crate and one of which forms the bottom of said crate, a plurality of horizontally disposed ring-shaped members vertically spaced between said frame members and having a portion of their inside surfaces in the same vertical plane as the inside surfaces of portions of said frame members, a plurality of vertical members attached to the inside surface of said frame members and said ring-shaped members, a plurality of rods each formed substantially into a U contacting said bottle throughout substantially the entire inside surface of said U and having a flat bottom and together with the vertical members defining a bottle supporting basket, the bottom elements of said rods intersecting and half of said rods having their intersecting portions offset downwardly, a substantially vertical support attached to the inside surfaces of each of said frame members proximate to their corners and projecting above said top frame member to form a loop thereabove, the end of said loop attached to said top frame member, a bottle retainer detachably engaging said crate.

3. A protective crate for a bottle comprising: a wire top frame member and a wire bottom frame member each horizontally disposed and vertically spaced, wire vertical members extending between and attached to both said top frame member and said bottom frame member, a cup-shaped wire basket including U-shaped wire members intersecting at the bottom of the basket to form the floor thereof, the top of said basket attached to and depending from said top frame member, a plurality of horizontal, wire, ring-shaped members attached to and circumscribing both said vertical members and said U-shaped members of said basket.

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