

[54] CRATE

[76] Inventor: Per Sigmund Strömberg, Wesselsvei
11, 2000 Lillestrom, Norway

[22] Filed: Mar. 21, 1973

[21] Appl. No.: 343,263

[30] Foreign Application Priority Data

Mar. 21, 1972 Norway..... 933/72

[52] U.S. Cl..... 220/83, 220/21

[51] Int. Cl..... B65d 7/42

[58] Field of Search..... 220/97 R, 21, DIG. 15,
220/DIG. 2, 83, 84; 211/126

[56] References Cited

UNITED STATES PATENTS

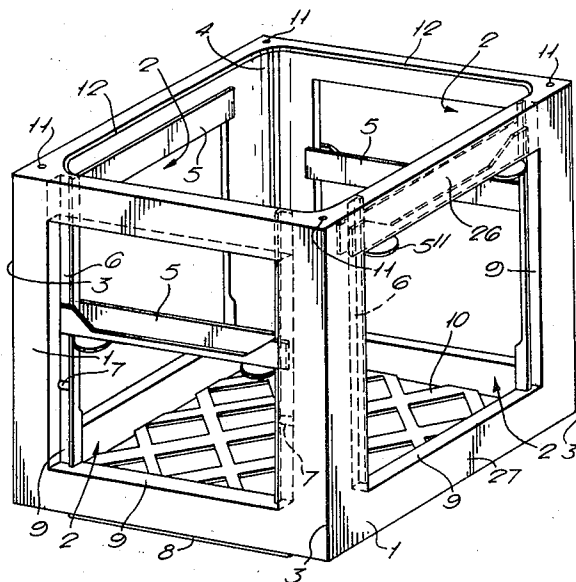
2,303,240	11/1942	Strong.....	220/21 X
3,392,869	7/1968	Needt.....	220/21
3,762,594	10/1973	Utz.....	220/21

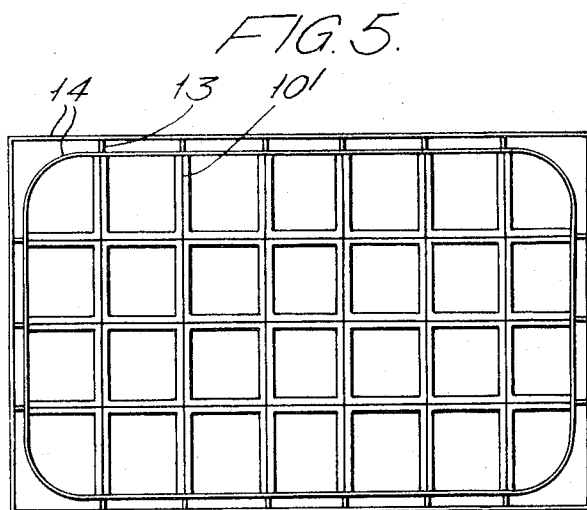
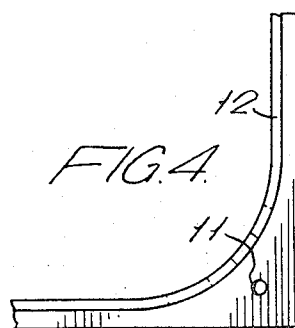
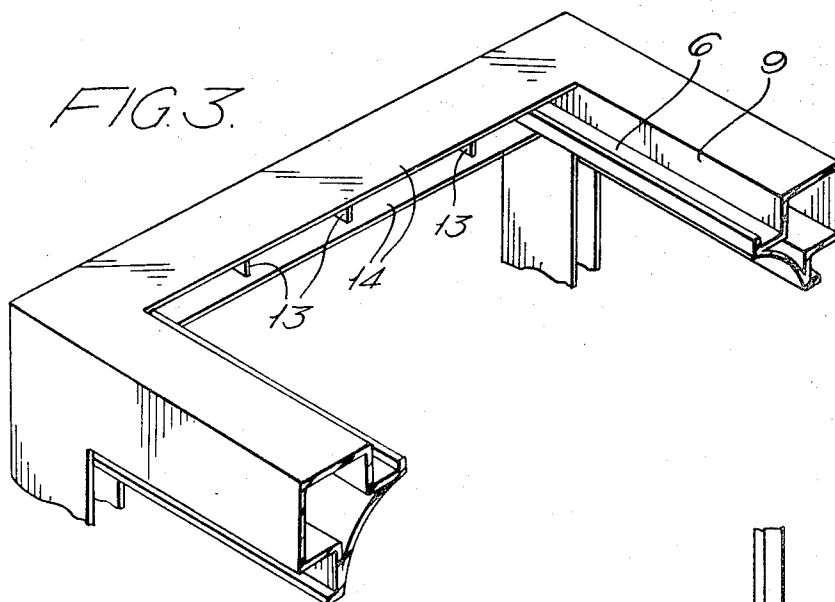
Primary Examiner—William I. Price
Assistant Examiner—Steven M. Pollard
Attorney, Agent, or Firm—Watson, Cole, Grindle & Watson

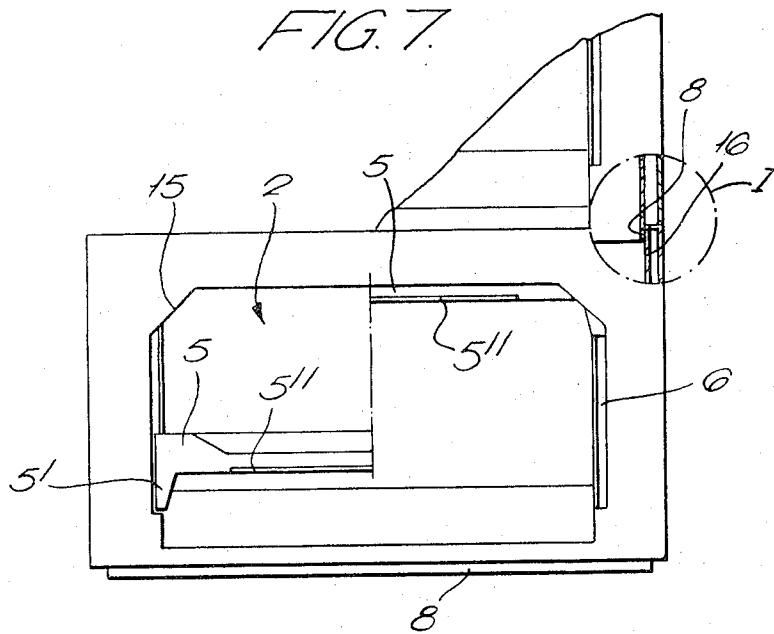
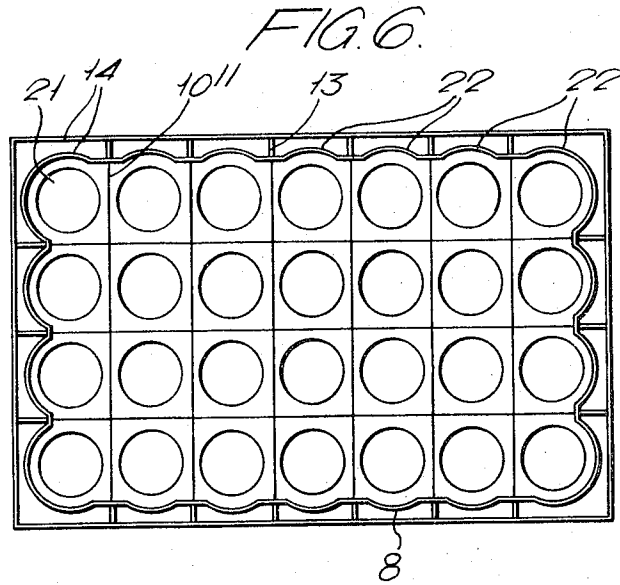
[57] ABSTRACT

The invention relates to a crate made of plastics for storage and transport of standard goods such as bottles. The crate has a substantially rectangular bottom with four vertical corner-columns protruding upwardly from the bottom. Horizontal beams connect the columns at the top and bottom thereof, and at least one side of the crate is provided with such a large opening that the goods may be removed through the opening when a crossbar or the like, which is movable over the opening, is moved out of its locking position. The crate is characterized in that all of the crate-walls are comprised of two wall-plates between which combined stays and spacers are suitably positioned, and that the crossbeams form U-profile.

10 Claims, 19 Drawing Figures







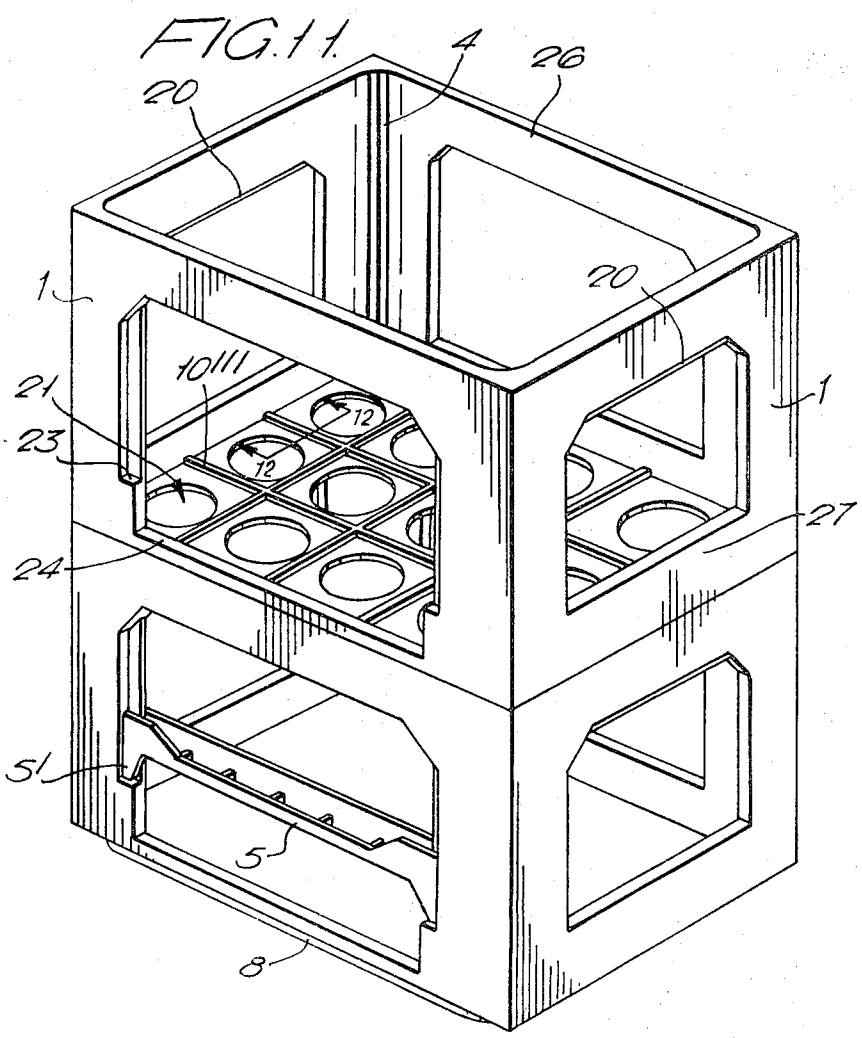
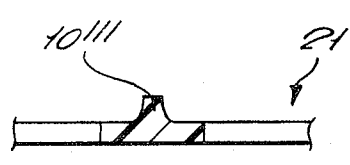


FIG. 12.



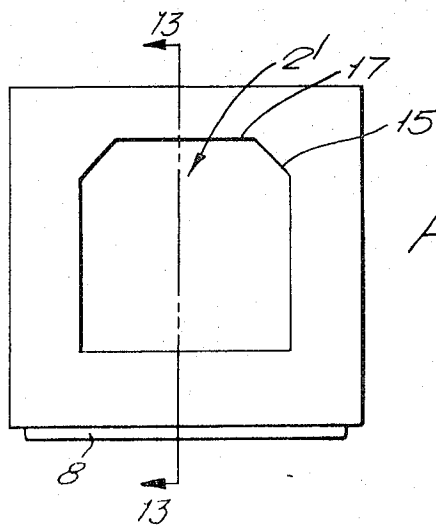


FIG. 8.

FIG. 10.

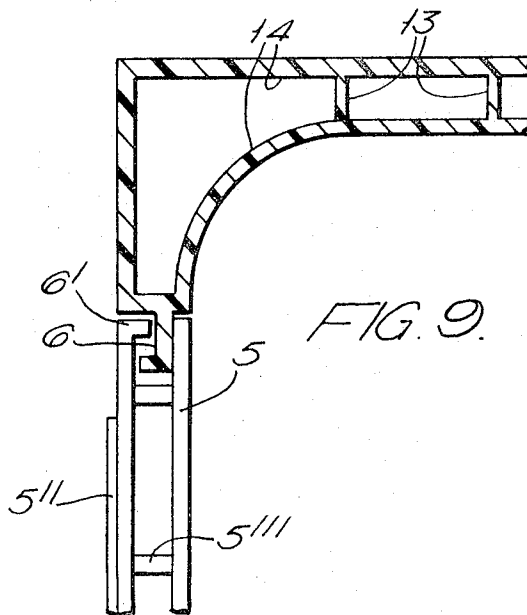
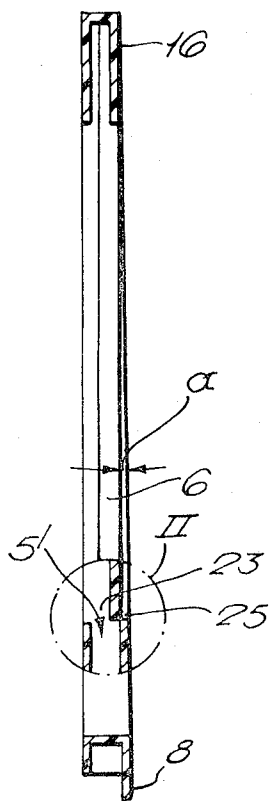


FIG. 9.

FIG. 13

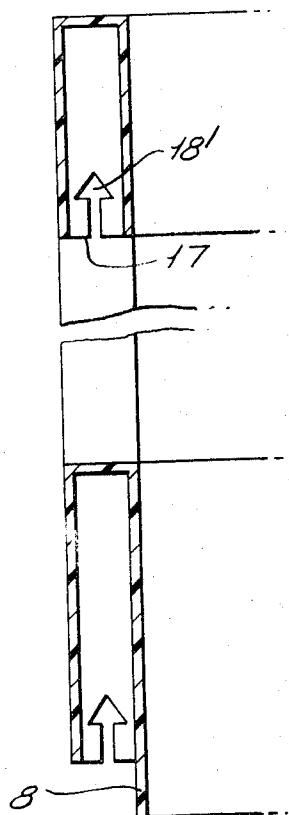


FIG. 14.

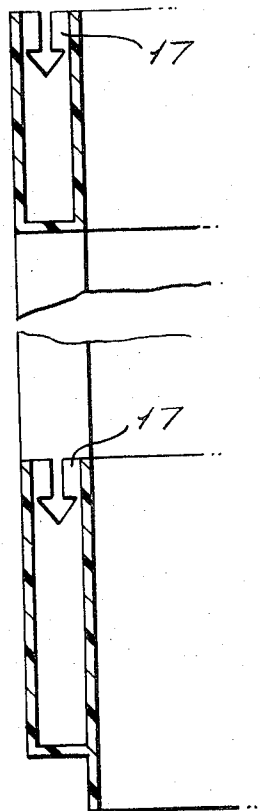


FIG. 15.

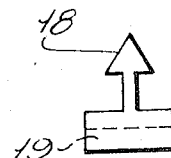
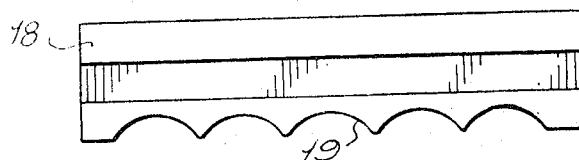


FIG. 15A

FIG. 16.

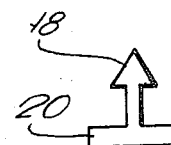
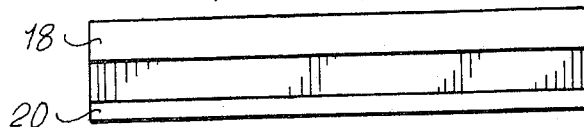


FIG. 16A

1

CRATE

The present invention relates to a crate made of plastics for storage and transport, preferably of standard goods like bottles, the crate having substantially a rectangular bottom from which four vertical corner-columns protrude upwardly, said columns at the top and bottom being connected by means of horizontal beams, and said crate having at least one side provided with such a large opening that the goods may be removed through the said opening when a crossbar or the like being movable over the opening is moved out of the blocking position.

The said crate-type is previously known in the market, inter alia in the grocery store business through the sale of beer, minerals and dairy products. The advantage with such crates is that the merchant does not need to remove empty crates in order to produce more bottles or the like. The crates may be piled, and the removal of the goods is carried out from the side of crate and not from the top as previously required, whereby space is saved in the salesroom while at the same time the customers are allowed to serve themselves. This is essential in e.g. super-markets. These crates are substantially made of plastics or a similar material. However, the disadvantage of prior crates of this type is that, if a piling-error occurs in the piling of several crates on top of each other so as to effect an incorrect load-distribution in the overall pile, the pile may be rendered unstable and may even overturn. This is due to the fact that the cross-beams of the crate, due to their construction, bend or twist upon heavy loading. Such twisting and bending of the crossbeams also occurs during the handling of crates containing heavy goods as e.g. bottles or the like, thereby limiting the external dimensions of the crate. Attempts have been previously made to overcome these disadvantages by e.g. increasing the thickness and the height of the beams, or to otherwise stiffen the said beams. This has however rendered the crates unwieldy and, moreover, quite difficult to clean. The cleaning of such crates has previously been difficult to carry out, in particular when one considers the strict requirements as regards hygiene e.g. in the production, storage and transport of milk, meat or the like.

The present invention overcomes the said disadvantages in that all of the crate-walls are comprised of two wallplates between which combined stays and spacers are suitably positioned, and that the cross-beams form a U-profile. By making the crate with hollow walls a substantial saving in materialcosts and a subsequent reduction in weight are obtained, while at the same time the crate is rendered substantially more rigid than before. Thus, the crate is made stronger at no expense to the goods-storage volume of the crate. By making the crate more rigid in this manner one is no longer restricted to any particular maximum dimensions for the crate.

According to another feature of the invention, the crate is provided with service openings on all four sides thereof, said openings each being provided with one movable crossbar. On previous crates it was not possible to provide each side of the crate with service openings because the bottom of the crate then would collapse due to the weak, conventional structure of the crossbeams. This is now, according to the invention, made possible while at the same time providing a crate

2

of large strength and rigidity. Since a cross-bar is arranged in each opening and is locked across the opening during transport, an additional stiffening of the crate is achieved, and the goods stored in the crate are prevented from shifting or falling out through the opening. The locking of the crossbar is effected by means of snap arrangements provided for the slidetrack of the crossbar.

Due to the completely new construction of the crate, it is thus possible to operate the crate from any one of its sides. This offers a variety of possible positions for one or several piles of crates isolated on the floor of a sales-room. Since the cross-bar in its extreme upper position slides behind the wall-plates of the U-profiled beams such that it is not visible from the outside of the crate, the crossbar does not obstruct the removal of goods from the crate through the service opening.

According to another and not the least important feature of the invention, all of the wall-surfaces of the crate are smooth. In addition, the crate-wall is closed at the top, the top face corners are provided with holes for ventilation, the bottom crate-wall is open and the extension of the inner plate at the bottom of the wall forms a stabilizing edge. Alternatively, the crate-wall may be closed at the bottom so that the bottomface-corners are then provided with holes for ventilation, the top of the crate-wall is open, and the extension of the inner plate at the top of the wall forms a stabilizing edge. The said stabilizing edge will assure that the crates are engaging each other when they are piled. These features are not the least important in the cleaning of the crate, since a crate with smooth walls will of course be far more hygienic in use than a crate having several projections as e.g. on the previously known crates. The holes provided for ventilation also permit an efficient cleaning of the crate at the interspace between the two wall-plates since the water between the walls may therefore be guided away. Besides, the holes may be convenient e.g. in the manufacturing of the crate.

In the piling of crates of this type, many stability requirements must be met. Accordingly, the exterior vertical corners of the crate are made right-angled, whereas their corresponding interior corners are made curved. And, the upper (alternatively the lower) interior edge is made slightly slanting downwardly and inwardly. The slanting edge serves make easier the piling of the crates as well as to prevent the stabilizing edges of the crates from wedging.

According to another embodiment of the invention, the said cross-bar consists of two parallel plates between which plates means are arranged which serve as combined spacers and connectors. The said cross-bar is furthermore provided with a guide-edge which may slide in the slidetrack for the cross-bar. Moreover, the cross-bar is provided with suitable finger-grips.

Further features of the invention will appear from the following description.

The invention will be explained below with reference to the drawings, wherein:

FIG. 1 is a perspective showing of an embodiment of the crate according to the invention;

FIG. 2a is a bottom plan view of a corner portion of the FIG. 1 crate and FIG. 2b is a perspective view of the FIG. 2a corner portion rotated 180°;

FIG. 3 is a perspective view of part of a side opening of the FIG. 1 crate;

FIG. 4 is an upper plan view of a corner portion of the FIG. 1 crate;

FIG. 5 is a bottom-view of another embodiment of a crate according to the invention;

FIG. 6 is a plan view of the interior of the bottom wall of a crate forming yet another embodiment of the invention;

FIG. 7 is a side elevational view of yet another embodiment of the crate according to the invention showing a portion of another such crate piled thereon;

FIG. 8 is a side elevational view of a crate of the invention which has neither a service-opening nor a cross-bar;

FIG. 9 is a sectional view of a corner portion of the crate showing engagement with another embodiment of a cross-bar;

FIG. 10 is a sectional view of an end wall of the FIG. 7 crate showing a slanting slide-track and the lowermost part thereof;

FIG. 11 is a perspective view of a pair of stacked crates in accordance with another embodiment of the invention, the upper crate having a bottom with separation edges;

FIG. 12 is a sectional view taken along line 12—12 of FIG. 11;

FIG. 13 is a sectional view taken along line 13—13 of FIG. 8;

FIG. 14 is a view similar to FIG. 13 showing a modification thereof;

FIGS. 15 and 16 show in side elevation for the closing of the openings appearing in FIGS. 13 and 14; and FIGS. 15A and 16A are end views of the FIG. 15 and FIG. 16 devices, respectively.

In FIG. 1 the corner-columns of the crate are denoted by 1, the service-openings by 2, the vertical interior and exterior corners by 4 and 3 respectively. 5 denotes the cross-bar which slides in the slide-track 6, two of the cross-bars 5 being shown at their extreme upper hidden positions, and two of the bars being shown in an intermediate position. One or several snap-arrangements 7 are positioned in the slide-track for locking the cross-bars in a lowered position. The cross-bar is provided with a finger-grip-means 5'. 8 illustrates the stabilizing edge being arranged at the bottom of the crate, but as will appear from the above the stabilizing edge may alternately be arranged at the top of the crate. 9 forms flat surfaces at the side-opening, and a strengthened wicker-work 10 is arranged in the bottom, upon which the stored objects may be placed. At the top (alternatively at the bottom) of the wall holes 11 are made in the corners for the purpose of ventilation. The inner edge 12 at the top (alternatively at the bottom) slopes slightly downwardly and inwardly.

FIG. 2a is a typical plan view of the bottom-corner (alternatively, the top-corner) of the wall, 10 being a wickerwork and 13 being stays of spacers in the wall. FIG. 2b shows the same as FIG. 2a, except that the wickerwork 10 is not shown, but the shape of the stabilizing edge 8 is clearly illustrated. Since the crate has double walls it is possible to rest pallets supporting piled crates on the top part of the top-beams of lower crates without weakening these lower crates. The underside of wickerwork 10 is stiffened, as shown by the heavy lines in FIG. 2a, and the lower edges thereof lie in the same plane as the rim of edge 8. Such lower edges and rim rest upon the pallet or pallets and the crates are stacked one atop the other. Because of the

rigidity of the top beams, the loaded pallet may rest thereon in a manner not made possible heretofore.

FIG. 3 shows a service-opening in a wall-side wherein it clearly appears that stays or spacers 13 are provided between the wall-plates 14. FIG. 4 shows the top (alternatively, the bottom) corner of a wall where the interior edge 12 slants inwardly and the corner is provided with holes 11.

FIGS. 5 and 6 illustrate two other embodiments of a bottom of the crate according to the invention. In FIG. 5 the squares of the wickerwork are parallel to the exterior sides of the crate. Spacers or stays 13 are arranged at the continuation of each strand of the wickerwork as indicated. Stays 13 are of course not limited to being arranged as shown, but may be placed in a greater or lesser number between the wall-plates 14 and independent of the placing of the T-profiles of wickerwork 10. The stiffening portion of the T-profile is indicated by 10'.

FIG. 6 shows another type of bottom wherein the inner walls of the crates have regular outwardly and vertically extending curved segments 22, such segments being evenly distributed along the complete inside of the crate. The bottom plate in FIG. 6 is provided with openings 21 and a network of stiffeners 10'' extending upwardly from the bottom. A wickerwork may also be arranged as e.g. shown in FIGS. 1 and 5 instead of a perforated bottom plate.

FIG. 11 shows another embodiment of the crate-bottom, as including e.g. openings in a plate with separating edges 10''' provided thereon. These separating edges 10''' serve both to separate the goods from each other which are placed in the crate, while at the same time providing the necessary stiffening of the crate-bottom. In this way they also function as stiffeners in the manner of 10' and 10'' of FIGS. 5 and 6, respectively. Instead of a perforated plate it is of course possible to provide the bottom with a suitable network of ribs.

FIG. 6 shows an underside view of the crate. Even though the crate here is illustrated with a wave-formed stabilizing edge, i.e., the extension 8 of the inside of the crate, it is of course possible to make the said stabilizing edge smooth as indicated in FIGS. 2b and 5, wherein only that part of the inner wall of the crate which is lying above the bottom will have the wave form. By having the wave form as shown in FIG. 6, the volume of the crate is utilized to a much larger extent without reducing the strength of the crate.

FIG. 7 shows another embodiment of the service-opening 2 and the cross-bar as compared to FIG. 1. The opening 2 is provided with inclined corners 15, which stiffen the crate even more, and the crate has in its wall-top 16 lesser wall-thickness than at its lower end, as indicated in FIG. 10. The sector I in FIG. 7 shows the manner in which the stabilizing edge 8 overlaps behind wall top 16. 5' indicates a downwardly extending flap on cross-bar 5, said flap when the cross-bar is in its lowermost position fitting into a corresponding opening 23 in the lower end part of slide track 6, as indicated by the sector II in FIG. 10. The left hand part of opening 2 in FIG. 7 shows the cross-bar in a lowered and obstructing position, whereas the righthand part shows the cross-bar in an upper position whereby the goods may be easily removed through the opening. 5'' indicates a suitable handgrip on the cross-bar, whereby the

said cross-bar may be moved vertically of the opening.

FIG. 8 shows a side of a crate according to the invention which is provided with an opening 2' serving only as a means for handling the crate by gripping edge 17 when the crate is to be transferred. FIG. 9 illustrates another embodiment of the cross-bar as comprising two plates between which combined spacers and connecting means 5''' are arranged. One of the plates is provided with a guide-edge 6' which slides within slide-track 6. The slide-track may at its lower end 23 be provided with holes for guidance of the cross-bar when in its lower position. The slide-edge of the cross-bar is running substantially parallel with the outer edge. The inner edge of the crate tapers slightly inwardly, as indicated by the angle α in FIG. 10, so that section 25 falls inside the crate. This section corresponds with the thickness of the crossbar-plates.

FIG. 11 shows a crate similar to that of FIG. 1 provided with corner-columns 1 curved at their inner surfaces as indicated at 4. The cross-beams 26 and 27 as well as the remaining walls of the crate have double walls as indicated in FIGS. 13 and 14 at the top, and in FIGS. 2, 3, 7, 9 and 10. A stumble edge 24 is preferably arranged at the service-openings. FIGS. 13 and 14 show a section through the crate-wall of FIG. 8. 17 denotes the opening between the wall-plates of the crate, which opening advantageously may be closed thereby reducing the possibility for intrusion of a foreign substance. Also, the closing of such openings, as by means of elements 19 or 20 of FIGS. 15 and 16, will facilitate easier lifting of the crate. Element 19 is scalloped along its lower edge to accommodate the fingers of the hand. These elements may be affixed within openings 17 by means of engagement portions 18, 18', which facilitate a snap-action.

With such a construction of the crates as aforescribed, it can be seen that various combinations of cratetypes and sizes may be utilized.

The crates according to the invention therefore provide unique construction of smooth outer surfaces and substantial rigidity.

I claim:

1. A crate for the storage and transport of goods such as bottles and the like, comprising a substantially rectangular bottom wall, vertical columns extending upwardly from all four corners thereof, horizontal beams interconnecting said columns at the top and bottom thereof, at least one side of the crate having an opening, a crossbar spanning said opening and movable vertically thereof between a lowered locked position and an upper position, said opening being of a size sufficient for the removal of the goods therethrough when

said crossbar is moved out of its locked position, each of the crate walls defined by said columns and said beams comprising a pair of spaced plates having spacers located therebetween, and said beams being U-shaped in cross-section.

2. The crate according to claim 1 wherein all four sides of the crate are provided with said openings, and vertically movable crossbars are provided at each said opening.

3. The crate according to claim 1 wherein the outer surfaces of each said wall are smooth, means are provided for closing the tops of each said wall, and ventilation openings are provided in said closing means for each of said columns, the bottom of said walls being open, and the inner one of said plates for said walls extending outwardly of the other of said plates at the bottom of said walls thereby forming a lower stabilizing edge for the crate.

4. The crate according to claim 1 wherein means are provided for closing the bottom of said walls, and ventilation openings are provided in said closing means for each of said columns, the top of said walls being open, and the inner one of said plates for said walls extending outwardly of the other of said plates at the bottom of said walls thereby forming an upper stabilizing edge for the crate.

5. The crate according to claim 1 wherein slidetracks are provided at said opening along which said crossbar moves, said slidetracks being provided with at least one snap means thereon for the locking of said crossbar.

6. The crate according to claim 1 wherein the exteriors of said columns are formed as right angles, the interiors of said columns are curved, and one of the upper and lower ends of said walls having an inner edge slanting slightly downwardly and inwardly of the crate.

7. The crate according to claim 1 wherein said crossbar comprises a pair of parallel plates having means therebetween serving as combined spacers and connectors, slidetracks being provided at said opening, said crossbar having a guide edge for moving along said slidetracks, and finger grips provided on said crossbar.

8. The crate according to claim 1 wherein the openings formed by said beams of U-shaped cross-section are closed by means of closing elements having means thereon for locking said elements by a snap action within said openings.

9. The crate according to claim 8 wherein the outer surfaces of said closing elements are flat.

10. The crate according to claim 8 wherein the outer surfaces of said closing elements are scalloped in the form of hand grips.

* * * * *