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H. A. KEINER ET AL

2,149,242

CRATE FOR MILK BOTTLES AND THE LIKE

Filed April 15, 1935

2 Sheets-Sheet 1

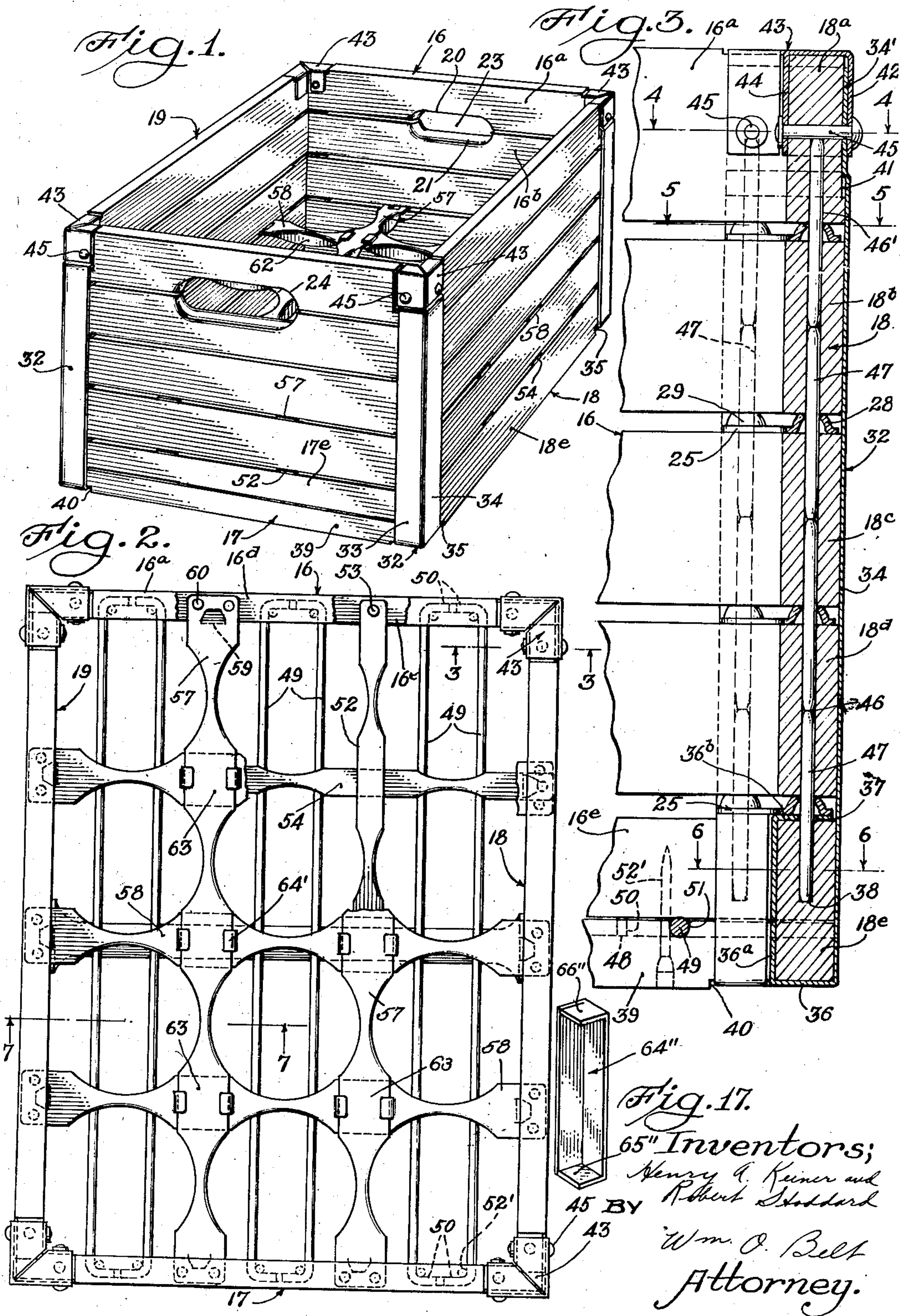


Fig. 17.
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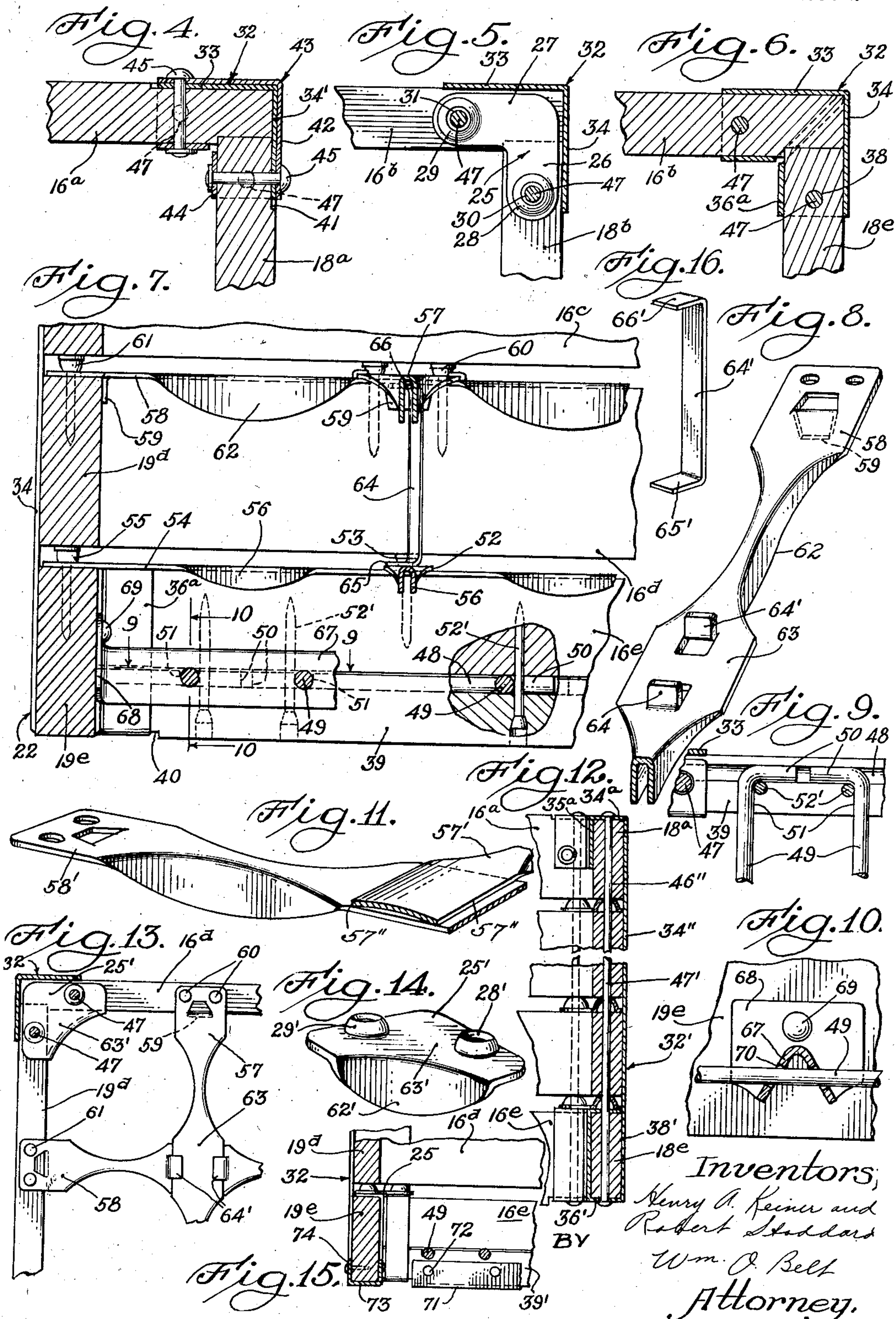
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UNITED STATES PATENT OFFICE

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CRATE FOR MILK BOTTLES AND THE
LIKE

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5 Claims. (Cl. 217—19)

This invention relates to crates for milk bot-
tles and the like and the primary object of our
invention is to improve the construction of such
crates.

Crates having the walls thereof formed from a
plurality of spaced slats have been so constructed
heretofore that it has been quite difficult to re-
place a broken slat because of the manner in
which the slats were secured, and an important
object of our invention is to facilitate the re-
placement of a broken slat so that this can be
accomplished quickly and economically.

Another object is to effectively reenforce the
corners of the crate and an ancillary object is
to utilize the corner reenforcements to space the
slats of the walls of the crate.

Further objects are to insure rigid support of
the lowermost slats of the walls of the crate to
thereby increase the rigidity of the crate; to reen-
force the walls of the crate intermediate the top
and bottom edges thereof; to effectively protect
the corners of the crate and the ends of the up-
permost and lowermost slats of the crate; to se-
curely retain bottle supporting members at the
bottom of the crate and to facilitate installation
of these bottle supporting members; to reen-
force opposite walls of the crate and the bottle
receiving members by extending a reenforcing
member between opposite walls of the crate and
passing the bottle supporting members through
this reenforcing member; to arrange dividing
rails in the crate to define bottle receiving spaces
in alignment with the bottle supporting members
and to interconnect the dividing rails at the in-
tersections thereof; to form the dividing rails to
provide ice supporting platforms at the intersec-
tions of the rails; to provide upper and lower sets
of dividing rails and to reenforce these rails by
reenforcing members extending between the sets
of rails at the intersections of the rails of each
set; to effectively prevent displacement of the
members interconnecting the slats of the walls of
the crate; and to provide a crate of simple and
economical construction which will effectively
withstand severe usage.

In the selected embodiments of the invention
illustrated in the accompanying drawings—

Fig. 1 is a perspective view;

Fig. 2 is a plan view;

Fig. 3 is a vertical sectional view taken sub-
stantially on the line 3—3 on Fig. 2;

Fig. 4 is a horizontal sectional view taken
substantially on the line 4—4 on Fig. 3;

Fig. 5 is a horizontal sectional view taken sub-
stantially on the line 5—5 on Fig. 3;

Fig. 6 is a horizontal sectional view taken
substantially on the line 6—6 on Fig. 3;

Fig. 7 is a fragmentary vertical sectional view
taken substantially on the line 7—7 on Fig. 2;

Fig. 8 is a fragmentary perspective detail view
of one of the dividers;

Fig. 9 is a horizontal sectional detail view taken
substantially on the line 9—9 on Fig. 7;

Fig. 10 is a vertical sectional detail view taken
substantially on the line 10—10 on Fig. 7;

Fig. 11 is a fragmentary perspective detail view
of the modified form of the dividers;

Fig. 12 is a view similar to Fig. 3 showing a
modified form of construction;

Fig. 13 is a fragmentary horizontal sectional
detail view showing a modified form of separator
installed in position;

Fig. 14 is a perspective view of the separators
shown in Fig. 13;

Fig. 15 is a fragmentary vertical sectional view
illustrating a further modified construction for
the bottom of the crate;

Fig. 16 is a view of a modified form for the di-
vider support; and

Fig. 17 is a detail view of a divider support.

The crate as illustrated in Figs. 1 to 7, inclu-
sive, includes end walls 16 and 17 and side walls
18 and 19. Each of these walls is made up of a
plurality of slats. The uppermost slat 16a in the
end wall 16 has a medially located recess 20 in
the lower edge thereof and the adjacent slat 16b
has a medially located recess 21 in the upper edge
thereof. The recesses 20 and 21 cooperate to
provide a handhole 23, a handhole 24 being simi-
larly formed in the end wall 17.

The side walls 18 and 19 extend between the
end portions of the end walls 16 and 17 and the
walls are firmly interconnected at each corner to
prevent separation. The slats comprising the
various walls are spaced apart and we have com-
bined the means for spacing the slats apart with
means for reenforcing the corners. Thus we
provide combined separating and reenforcing
members 25 (Fig. 5) which include right angu-
larly extending limbs 26 and 27. Embossures 28
and 29 are provided near the ends of the limbs 26
and 27, respectively, and openings 30 and 31 are
formed in the embossures 28 and 29, respectively.

A corner member 32 is also provided at each
corner of the crate. Each corner member 32
comprises right angularly extending parts 33 and
34 which are respectively engaged with the outer
faces of the end and side walls. Each of the
lowermost slats of the side walls, as for example
the slat 18e of the side wall 18, has a recess

in the lowermost edge at each end thereof. The part 34 of each corner member includes an extension which, in the case of the side wall 18, is folded into the recess 35 adjacent the corner member, as indicated at 36 (Fig. 3). The extension is then folded up over the inner face of the lowermost slat 18e of the side wall, as indicated at 36a, and then across the top edge of this slat to terminate in spaced relation with the outer face of the slat, as is indicated at 36b. An opening 37 is provided in the section 36b in alignment with a bore 38 in the slat 18e.

Each end wall includes a shoe piece 39, to be described more fully hereinafter, at the lower end thereof, and each shoe piece has a recess 40 in the lower edge at each end thereof. The part 33 of each corner member 32 includes an extension like the extension 36 which is arranged in the adjacent recess 40, and this extension also includes sections which extend over the inner face of the shoe piece and the inner face of the lowermost slat of the end wall. Another section of the extension extends across the top of this lowermost slat of the end wall and is arranged similarly to the section 36b.

The uppermost slat of each wall is recessed on its outer face near the ends thereof, as indicated at 41, and the upper ends of the parts 33 and 34 of the corner members are inset as is illustrated in Fig. 3 wherein the upper section 34' of the part 34 is inset to be disposed in the recess 41 in the outer face of the slat 18a. The upper sections of these parts are so inset to permit the limbs of corner caps to be extended thereover in alignment with the main extent of the parts 33 and 34. This is also illustrated in Fig. 3 wherein a depending limb 42 on the corner cap, generally indicated by 43, is aligned with the main extent of the part 34. The corner cap 43 includes a depending limb 44 which depends over the inner face of the slat 18a and it also includes other depending limbs which embrace the upper slat 16a of the end wall 16 in the same way in which the limbs 42 and 44 embrace the slat 18a. The opposite depending limbs are connected together and to the slats embraced therebetween by rivets such as 45. The slats of each of the walls intermediate the top and bottom slats have a bore therein near each end thereof, such bores being indicated by 46 in Fig. 3, and pins 47 are passed through these bores to secure the slats in position. The pins 47 are of a length about equal to the height of the slats of the walls, which slats are of uniform height.

In assembling a wall, for example, the wall 18, the bottom slat 18e is inserted into the area enclosed by the lower end of the part 34 and the sections 36, 36a and 36b of the extension of said part 34. The bore 38 that extends about halfway through slat 18e is aligned with the opening 37 in the section 36b. Then a pin 47 is passed through the opening 37 into the bore 38. Since the bore 38 extends only halfway through the section 18e a pin 47 so installed projects above the section 36b. Then one of the combined separating and reinforcing members 25 is arranged in position by passing the pin 47 through the opening 30 in the embossure 28. Then the bore 46 at the proper end of the slat 18d is passed over the installed pin 47 which then extends about halfway through this bore 46. Thus when a second pin 47 is inserted into the bore 46 it will engage the top of the first pin and will extend above the top edge of the slat 18d. Then another combined separating and reinforcing mem-

ber 25 is positioned above the slat 18d by passing the second pin 47 through the opening 30 in the embossure 28 of this member. The slats 18c and 18b are mounted in position in the same manner as the slat 18d and then the slat 18a is mounted over the slat 18b. The lower edge of the slat 18a rests on the top of the embossure 28 of the combined separating and reinforcing member 25 at the top of the slat 18b, and the uppermost pin 47 projects into the bore 46' that extends about halfway through the slat 18a. The above described procedure is also carried out at the opposite end of the wall 18 which is therefore completed when the slat 18a is in position.

Then the end wall 16 is built up in a similar manner starting with the lower slat 16e to which a shoe piece 39 will have been joined as will be described. The combined shoe piece and slat 16e are handled in the same manner as the slat 18e. When the slat 16a is in position the wall 16 will have been built up.

Next the corner member 43 is installed at the top of the corner between the walls 18 and 16 with the depending parts thereof positioned as described. Rivets 45 are passed through the depending parts of the corner member 43, parts 33 and 34, and the uppermost slats and fasten these parts together. These rivets extend across the upper ends of the uppermost pins 47 and prevent displacement of the pins. Thus the end and side walls are securely connected at each corner since the above procedure is carried out at each corner of the crate.

The lowermost slats 16e and 17e of the end walls 16 and 17 are of less height than the other slats in the end and side walls but when the shoe pieces 39 are added to the slats 16e and 17e the aggregate height of these slats and shoe pieces is equal to the height of the other slats. The shoe pieces 39 are joined to the slats 16e and 17e by nailing or in other suitable manner, and the location of the nails will be described more fully hereinafter.

As best shown in Fig. 9, the shoe pieces 39 are routed in their upper surfaces near the outer edges thereof to provide grooves 48. A plurality of rods 49 are provided and these rods are arranged in pairs to provide bottle supports at the bottom of the crate. Each of these rods has a right angularly extending foot portion 50 at each end and these foot portions 50 are mounted in the grooves 48. As illustrated in Fig. 7, grooves 51 are formed in the top surface of the shoe pieces 39 which extend from the grooves 48 to the inner sides of the shoe pieces 39. The grooves 51 are arranged in pairs across the crate so that when rods 49 are rested therein a pair of rods will extend below each of the bottle receiving spaces defined by the dividing rails, to be explained more fully hereinafter. The nails which interconnect the shoe pieces 39 and the bottom slats 16e and 17e preferably pass through the shoe pieces adjacent the grooves 51 so as to pass through the right angle defined by the foot portions 50 and the main extent of the rods 49. Nails so located are indicated by 52' and it is these nails that secure the shoe pieces to the lower slats. In the illustrated form of the invention the foot portions 50 are rested in the grooves 48 to extend toward each other but it is to be understood that the foot portions could be arranged to extend in opposite directions without departing from the purview of our invention.

It has been stated that the rods 49 are arranged in pairs in alignment with the bottle re-

ceiving spaces in the crate and that the bottle receiving spaces are defined by dividing rails. In the crate as illustrated, there are two sets of dividing rails, an upper set and a lower set. The lower set of dividing rails includes rails 52 which extend between the end walls 16 and 17 and the end portions of these rails in the crate as constructed rest on the upper edges of the slats 16e and 17e and they are secured to these rails by nails 53 which have enlarged heads that cooperate with the embossures 29 to space the slats 16e and 16d and 17e and 17d. Other rails 54 extend between the side walls 18 and 19 and intersect the rails 52 and the areas bounded by these intersecting rails and the rails and the walls of the crate afford the bottle receiving spaces. The ends of the rails 54 rest on the top edges of the lowermost slats 18e and 19e of the side walls 18 and 19 and are secured thereto by nails 55 which have enlarged heads that cooperate with the embossures 28 to space the slats 18e and 18d and 19e and 19d apart. As best shown in Figs. 2 and 7, the rails 52 and 54 are preferably formed of flat strips and intermediate the intersections of these rails one with the other they are bent downwardly to provide depending flanges 56 which cooperate with the peripheries of round bottles mounted in the bottle receiving spaces to retain these bottles in position.

The upper set of dividing rails consists of rails 57 that extend between the end walls 16 and 17 and rails 58 that extend between the side walls 18 and 19. The rails 57 and 58 are wider than the rails 52 and 54. Tongues 59 are struck from the rails 57 and 58 near the ends, as best illustrated in Figs. 7 and 8. These tongues engage the inner sides of the walls to which the rails are secured and afford reinforcement. In the form of the invention shown, the ends of the rails 57, beyond the depending tongues 59, are rested on the top surfaces of the slats 16d and 17d in the end walls and are secured thereto by nails 60 which have enlarged heads that cooperate with the embossures 29 to space the slats 16c and 17c from the slats 16d and 17d. The ends of the rails 58 beyond the tongues 59 rest on the top edges of the slats 18d and 19d of the side walls and the ends of these rails are secured to these slats by nails 61 which have enlarged heads that cooperate with the embossures 28 to space the slats 18c and 19c from the slats 18d and 19d.

The upper rails 57, 58 are bent downwardly at their side edges and at spaced intervals intermediate the intersections of the rails to provide depending flanges 62 which engage and assist in retaining the bottles in spaced relation in the pockets formed for them by the intersecting rails. These rails 57, 58 are made of strips wider than the strips of the lower rails 52, 54 and the overlapping portions of the rails between the flanged portions provide substantial platforms 63 at the corners of the pockets formed by the intersecting rails. In practice the crate is filled with bottles of milk and crushed ice is thrown in upon the rails 57, 58 and distributed around the bottles. The rails not only retain the bottles in spaced relation but they substantially fill the space between the bottles and constitute a support for the crushed ice and retain it about the bottles for refrigerating purposes. Lugs 64' at the intersections of the rails are spaced apart on one set of rails to receive the rails of the other set upon which they are clenched. These lugs interconnect the rails sufficiently to hold them rigid and prevent them from separating. The rails may be secured together at their intersections by riveting

or welding, or they may be formed as shown in Fig. 11 in which the rails 57' are curved transversely or formed concavo-convex at their intersections with the rails 58' and the edges 57'' tend to dig into the surface of the rails 58' and prevent relative movement. The rails 57, 58 are, of course, rigidly secured at their ends to the walls of the crate and for some purposes it may not be necessary to provide any interconnection between the rails at their intersections, but we prefer to connect the rails to hold one set of rails snugly against the other set and thus provide a grid-like divider having its parts sufficiently united to distribute the strains throughout the grid and to all of the fastening devices, and to relieve the strain upon individual rails and fastening devices, and to furnish that degree of rigidity desirable for dividing means of this kind.

Further reinforcement for the dividing rails at the intersections thereof may be afforded by extending reinforcing members between the intersections of the rails 52 and 54 and 57 and 58. A reinforcing member for this purpose is shown in Fig. 7 and is indicated by 64. This reinforcing member includes a concavo-convex body having foot portions 65 and 66 at opposite ends thereof. The foot portion 65 is rested on an intersection of the rails 52 and 54 and is secured thereto in an approved manner as by spotwelding, riveting or the like. The foot portion 66 is mounted below the intersection of the rails 57 and 58 vertically aligned with the intersection of the rails 52 and 54 to which the foot portion 65 is secured and this foot portion 66 is connected to the intersection of the rails 57 and 58 in an approved manner as by spotwelding, riveting or the like.

A modified form of such a reinforcing member is shown in Fig. 16 and this member is formed from a flat strip. The body 64' includes foot portions 65' and 66'. The foot portions 65' and 66' are arranged in vertical alignment and the body 64' extends from one end of one foot portion to the aligned end of the other foot portion so that the reinforcing member, when viewed in side elevation, is substantially U-shaped. A reinforcing member of this kind is mounted in position in the same manner as that in which the reinforcing member 64 is mounted in position.

A further modified form of reinforcing member is shown in Fig. 17 and herein the body 64'' includes right angularly extending walls, one of which is longer than the other. The extending end portions of the longer wall are bent into parallel relation with the ends of the shorter wall to provide foot portions 65'' and 66''. This reinforcing member is mounted in the same manner as that in which the reinforcing members 64 and 64' are mounted.

The bottom slats of the side walls and the bottle supporting members 49 may be reinforced by extending a substantially V-shaped reinforcing member such as 67 between such lowermost slats and engaging the flat foot portions, such as 68 at opposite ends of the member 67, with the inner sides of these lowermost slats. The foot portions 68 may be secured to the slats by nails 69 or in any other approved manner. Aligned openings 70 are formed in the inclined sides of the V-shaped member 67 and the supporting rods 49 are passed through these openings. Thus by mounting the member 67 midway between the end walls 16 and 17 this member not only reinforces the lowermost slats of

the side walls but also the supporting rods 49.

The combined separating and reenforcing members 25 of the form shown in Fig. 5 do not provide ledges or platforms on which ice may be supported at the corners of the crate and do not include bottle engaging flanges which will retain the bottles in the corner bottle receiving spaces against movement. Therefore a combined separating and reenforcing member such as that illustrated in Figs. 13 and 14 may be provided for use between the slats 16c and 16d and 17c and 17d in the end walls and the slats 18c and 18d and 19c and 19d in the side walls so as to be aligned with the dividing rails 57 and 58. This member is indicated by 25' and includes embossures 28' and 29' similar to the embossures 28 and 29 but instead of including right angularly extending limbs the member 25' is formed from a substantially square sheet of material which is bent downwardly diagonally opposite the outermost corner thereof to provide a bottle engaging flange 62'. The space intermediate the depending flange 62' and that part of the member 25' aligned with the embossures 28' and 29' provides an ice supporting platform 63'. The flanges 62' serve to hold the bottles in the corner bottle receiving spaces against movement.

In the invention as thus far described, the slats of the various walls have been secured in position by passing short pins 47 through bores extending through the slats at opposite ends thereof. When one of such slats is broken the rivets 45 passing through the uppermost slat in the wall in which the broken slat is contained are removed as well as the other rivets passing through the corner caps 43 through which these first named rivets pass. The corner caps 43 are then removed after which the slats may be lifted from position, and when the broken slat is reached it is removed and replaced and the wall is reassembled as described.

In Fig. 12 a modified form of construction for the interconnection of the slats of the walls is shown and in this construction no corner caps are provided at the upper edges of the corners. In this construction the lower ends of the corner members, generally indicated by 32', are arranged in the same manner as the lower ends of the corner members 32 and the slats 18e and 16e are mounted in position in the manner described. However, instead of employing a plurality of short pins 47 a long pin 47' is provided. Furthermore, the bores in the uppermost slats extend entirely through these slats as indicated at 46'' and the long pins 47' extend through these bores 46'' beyond the tops of the slats 18a and 16a as illustrated in Fig. 12. Furthermore, the upper end of the part 34'' of the corner member 32 is bent inwardly as indicated at 34a to pass across the top of the slat 18a and this part is then bent downwardly as indicated at 35a to extend over the inner face of the upper slat 18a and the pin 47 passes through an opening in the part 34a. To prevent displacement of the upper end of the pin 47' it is peened over. It will also be noted that the pin 47' extends through a bore 38' that extends entirely through the lowermost slat 18e. The lower end of the pin 47' extends through an opening in the section 36' and this end of the pin 47' is also peened over. Rivets 45' pass through the parts 34'' and 35a and the uppermost rail 18a to secure this rail in position. The part of the corner member 32' corresponding

to the part 33 of the corner member 32 is arranged similarly to the part 34'' of the corner member 32' to embrace the upper edge of the slat 16a. When a broken slat is to be replaced in a construction employing the pins 47' the peened parts at corresponding ends of the required pins 47 are straightened to permit removal of these pins whereupon the parts such as the parts 34a and 35a are straightened to permit the removal of the slats down to the broken slat.

Either the corner arrangement shown in Fig. 3 or that shown in Fig. 12 can be used in connection with the other novel features which we have described heretofore but one or the other of these constructions should be used at all corners of a particular crate.

In Fig. 15 a modified form for the shoe piece 39 is illustrated and herein the lower end and parts of the inner and outer faces of the shoe piece 39' are embraced by a metallic strip 71 which is retained in position by nails 72 or the like. Moreover, a metallic strip 73 embraces the bottom edge and lower parts of the inner and outer faces of the bottom slat 19e of the side wall shown herein. This strip 73 is retained in position by nails 74 or the like. Thus, Fig. 15 shows how the bottom edges of the crate may be effectively protected against damage.

The crate of this invention has the corners thereof effectively protected against damage and if one of the slats is broken in the use of the crate, as happens quite frequently, this slat may be easily replaced. The pins interconnect the slats and impart rigidity to the crate and the loose mounting of the slats on the pins facilitates repair and replacement without lessening this rigidity.

The dividing rails 57, 58 are made of strips sufficiently wide to form a grid which substantially fills the space between the bottles and not only maintains the bottles in spaced relation but also forms a support which will hold crushed ice about the bottles. The icing of bottled milk in crates for wagon delivery is quite necessary in hot weather and the grid formed by the dividing rails retains the crushed ice about the bottles in a satisfactory manner. The dies necessary for forming the dividing rails are comparatively inexpensive and the rails can be easily assembled in cross formation and secured together and to the walls of the crate to form an inexpensive grid which is strong, sufficiently rigid for all purposes and supports the ice packed about the bottles. By securing the rails together at their intersections they are maintained against the relative movement to which they may be subjected in commercial use of the crate and this also increases the rigidity of the grid.

The spacers on the corner reenforcing members insure uniform spacing of the slats without requiring separate parts for this purpose, and these reenforcing members being connected to the pins which interconnect the slats serve also to strengthen and increase the rigidity of the crate. The manner of mounting the bottle supporting rods in the walls of the crate is simple, novel and can be accomplished at low cost and the rods are firmly held against displacement.

While we have illustrated and described selected embodiments of our invention it is to be understood that these are capable of variation and modification and we therefore do not wish to be limited to the precise details set forth but desire to avail ourselves of such changes and altera-

tions as fall within the purview of the following claims.

We claim:

1. In a crate for bottles and the like, a plurality
5 of dividing rails extending between opposite walls
of the crate, the rails extending between one set
of said opposite walls intersecting the rails ex-
tending between the other opposite walls, the
spaces defined between said intersecting rails and
10 said rails on the walls of the crate affording bottle
receiving spaces, certain of said rails having por-
tions of substantially concavo-convex formation
at least at the points of intersection of these rails
with other of the rails, the concavo-convex for-
15 mation of said portions providing sharp edges at
the lower corners thereof, said other of said rails
having substantially flat portions at least at the
points of intersection thereof with said certain of
said rails, said sharp edges digging into said sub-
20 stantially flat portions to interconnect the rails
at the points of intersection and permit relative
movement therebetween.

2. In a crate for bottles and the like, a plurality
of dividing rails extending between opposite walls
25 of the crate, the rails extending between one set
of said opposite walls intersecting the rails ex-
tending between the other opposite walls, the
spaces defined between said intersecting rails and
said rails and the walls of the crate affording bot-
30 tle receiving spaces, the parts of said rails inter-
mediate the intersections thereof being bent
downwardly to provide bottle engaging flanges,
certain of said rails being of substantially con-
cavo-convex formation to provide sharp edges at
35 the lower corners thereof engageable with the
rails intersecting said certain rails to dig there-
into and prevent relative movement between the
intersecting rails.

3. In a bottle crate having means therein de-
fining bottle receiving spaces, bottle supports at
40 the bottom of said crate and aligned with said
bottle receiving means, and means for retaining
said bottle supporting members in said crate and
including portions at the lower edges of opposite
walls of said crate each having longitudinally
45 extending grooves therein spaced inwardly from
the sides of said portions, said portions having
other grooves therein extending in angular re-

lation with the first named grooves from said
first named grooves to only one side of said por-
tions, said bottle supporting members having an-
gularly extending foot portions thereon arranged
5 in said longitudinally extending grooves upon pas-
sage of said bottle receiving members through
said other grooves, the extension of said bottle
supporting members through said other grooves
preventing movement thereof toward and away
10 from each other and the disposition of said foot
portions in said longitudinally extending grooves
preventing longitudinal movement of said bottle
supporting members relative to said opposite
walls.

4. In a bottle crate having means therein de- 15
fining bottle receiving spaces, bottle supports at
the bottom of said crate and aligned with said
bottle receiving spaces, and means for retaining
said bottle supporting members in said crate and
including members secured at the lower edges of 20
opposite walls of said crate and having longitu-
dinally extending grooves in the upper edges there-
of spaced inwardly from the sides of said mem-
bers, said members having other grooves in the
upper edges thereof and in which said bottle sup- 25
porting members are seated, said bottle support-
ing members having angularly extending foot
portions thereon arranged in said longitudinally
extending grooves to prevent longitudinal move-
ment of said bottle supporting members relative 30
to said opposite walls.

5. In a bottle crate, a plurality of cross-rails
dividing the crate into bottle receiving pockets,
said rails being formed from flat strips of sub-
stantial width and at least one of said rails at 35
each intersection being of concavo-convex forma-
tion at its intersection with the other rail at said
intersection and having the concave side thereof
adjacent said other rail, the rails being bent at
their side edges at the sides of said pockets to form 40
bottle engaging flanges and forming horizontal
platforms at their intersections between said bot-
tle receiving pockets whereby said convex side of
said one rail and said other rail support crushed
ice distributed thereon and about the bottle for 45
refrigerating purposes.

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