Oct. 24, 1933. W. K. KINGSLAND 1,932,273

COLLAPSIBLE CRATE

Filed Jan. 22, 1932 2 Sheets-Sheet 1

Fig. 1.

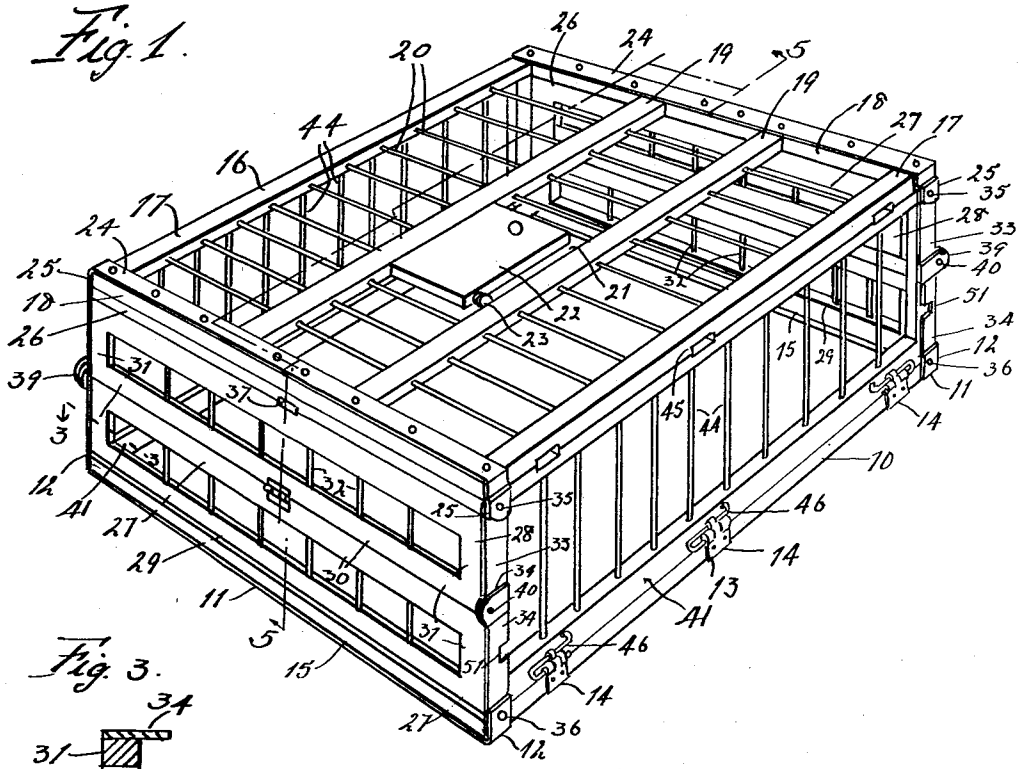
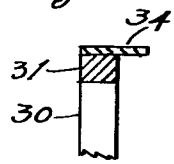


Fig. 3.



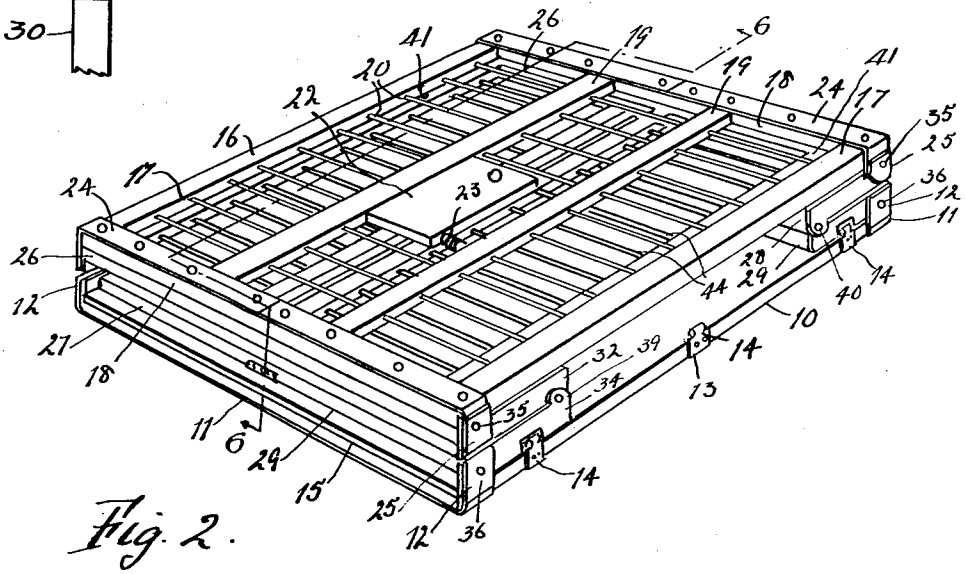


Fig. 2.

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Fig. 4.

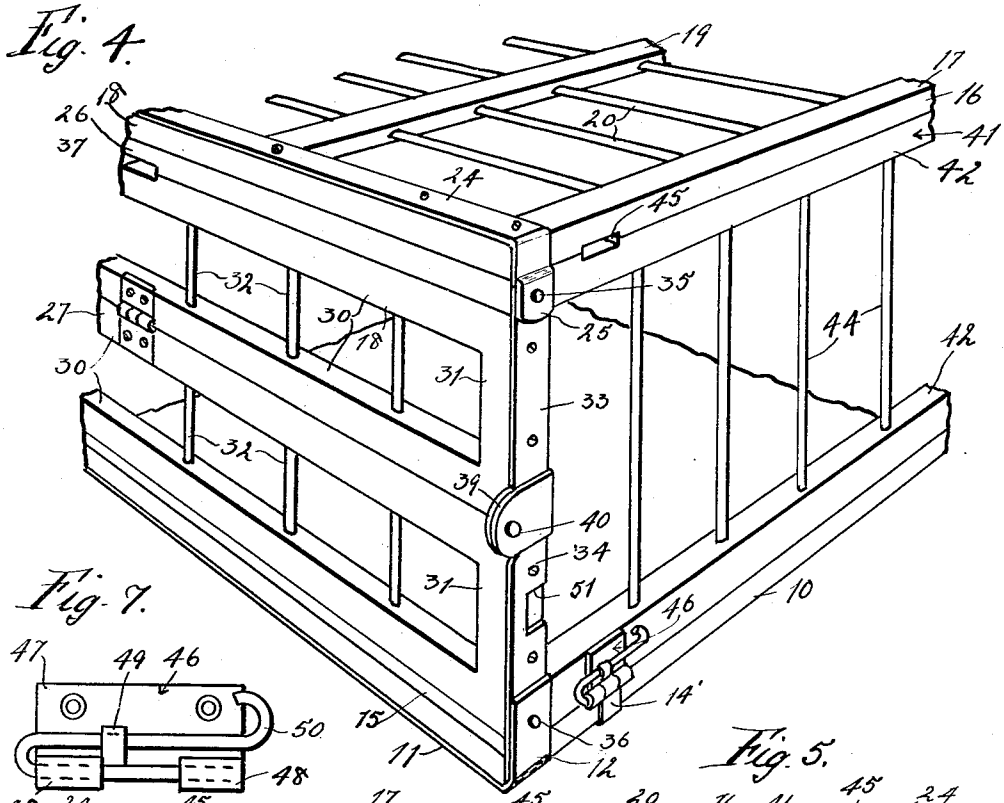
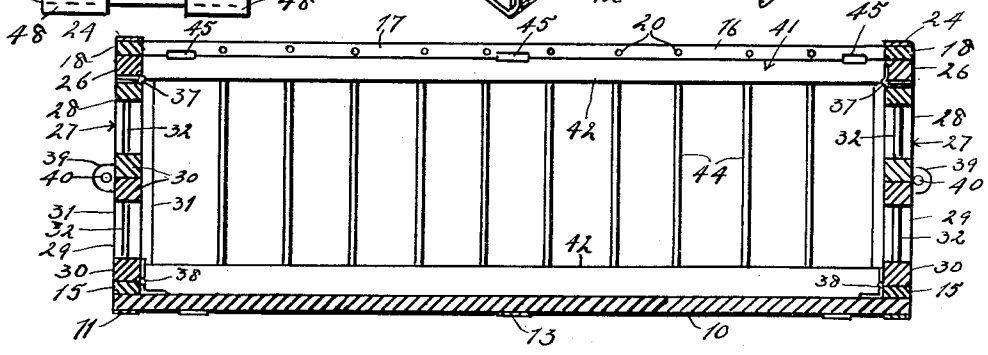


Fig. 7.

Fig. 5.



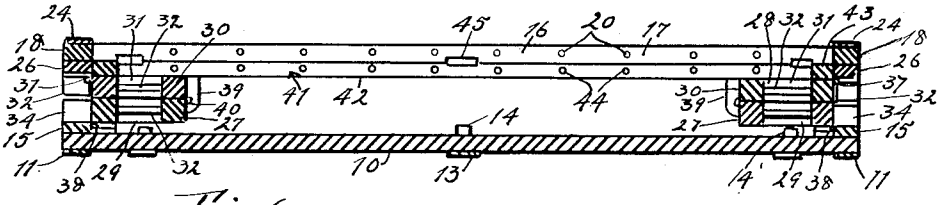


Fig. 6.

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UNITED STATES PATENT OFFICE

1,932,273

COLLAPSIBLE CRATE

William K. Kingsland, Philadelphia, Pa.

Application January 22, 1932. Serial No. 588,077

3 Claims. (Cl. 217—47)

My invention relates to new and useful improvements in a collapsible crate and has for one of its objects to generally improve the construction of such devices in order to simplify the manufacture and provide a crate which will be relatively inexpensive.

Another object of the invention is to provide hinge strips or sills on the crate bottom to which the lower ends of a pair of the upright walls are hinged in order that when said walls are collapsed there will be a space remaining between the collapsed upright walls and the bottom. Such construction is provided in order to prevent any foreign matter on the crate bottom from interfering with the collapsing of the crate.

Another object of the invention is to so construct the crate that when in a partially open condition the inner surface of the crate bottom will be practically unobstructed and therefore may be readily and quickly scraped and otherwise cleansed.

A further object of the invention is to provide a unique method of hinging the sectional upright walls to the bottom and top of the crate as well as the sections to each other.

A further object of the invention is to utilize parts of the hinge elements, or at least some of the parts thereof, as strengthening or binding and buffer straps for some of the parts of the crate.

A still further object of the invention is to provide unique fastenings for the swingingly hinged upright walls of the crate.

With these and other ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its construction in detail, referring by numerals to the accompanying drawings forming a part of this application, in which:—

Fig. 1 is a perspective view of a collapsible crate constructed in accordance with my invention and shown in a set-up or operative condition.

Fig. 2 is also a perspective view of the same crate in a collapsed condition.

Fig. 3 is an enlarged fragmentary section of one of the corner rails of one of the collapsible sectional upright walls on about the line 3—3 of Fig. 1 to plainly illustrate a detail of construction.

Fig. 4 is an enlarged fragmentary perspective view of a corner of the crate in a set-up position.

Fig. 5 is a longitudinal sectional view on the line 5—5 of Fig. 1.

Fig. 6 is a longitudinal sectional view on the line 6—6 of Fig. 2.

Fig. 7 is an enlarged detail face view of one of the fastening members.

In carrying out my invention as herein embodied, 10 represents the bottom or base of the crate which is of imperforate construction and is, in effect, a flat panel of the desired size and configuration.

Metal straps or bands 11 are secured to the underface of the bottom adjacent each end and the ends of said metal bands or straps are turned up to produce ears 12, and if found desirable at other places, or locations on the underface of the crate bottom may be secured one or more additional straps 13, one being herein illustrated, and both ends of this particular strap or band is bent up over the edges of the crate bottom and fashioned to produce a bolt or fastener keeper 14.

All of these straps act as guards and protect the under surface of the crate bottom to prevent undue damage to said crate bottom which is generally of wood and they also act as runners so that the crates may be readily slid along platforms or in vehicles, and in addition, the end most straps or bands act as hinge leaves due to the formation of the ears 12 therefrom at each end.

Spacer strips or risers 15 are secured to the upper surface of the crate bottom at opposite ends and are of the same width as the rails of the upright walls to be presently described.

The numeral 16 denotes the top of the crate and is preferably of lattice work although under some conditions it might be made imperforate if it should be desirable to use the same as a packing box or case. In the particular form illustrated, the top includes side rails 17, end rails 18 and intermediate rails 19 and between the rails are mounted suitable bars 20 spaced apart any desirable distance, and in some suitable locality between a pair of the rails the bars are spaced a greater distance apart in order to provide an access opening or doorway 21 which is normally closed by a door 22 slidably mounted upon one of the bars and normally forced toward one of the rails by a spring 23 surrounding the bar on which the door is slidably and rotatably mounted and when said door is moved into engagement with a rail by the spring, it will be held in the closed position by a suitable fastening device (not shown) which may be in the form of the usual pin projecting from the rail for

registration with a hole in the side of the door.

On the upper surface of the crate top and more particularly on the upper surface on the end rails 18 are mounted and secured the metal bands or straps 24 which act as guards to reduce the possibility of damage to the top of the crate and the outer ends of these straps or bands are bent down to form ears 25 which like the ears 12 act as hinge leaves as will be hereinafter more fully described.

Spacer strips or risers 26 are secured to the undersurface of the crate top at both ends and more particularly to the undersides of the end rails 18 and said spacer strips are of the same width as the rails of the upright walls and they are of the same thickness or height, at least, as the width of the rails of the upright walls, the purpose of which will be obvious from the description below.

Two of the upright walls 27, which for purpose of description will be termed the end walls, are each made in two sections 28 and 29 and both of said sections are of the same dimensions and may consist of solid panels or as shown herein they may be of open work construction and each section then consists of parallel horizontal rails 30 and end rails 31 with suitable bars 32 disposed between pairs of rails, as between the horizontal rails 30.

To each end of the end wall section 28 is secured a metal band or strap 33 and to each end of the end wall section 29 is secured a similar metal band or strap 34, and the upper end of the straps 33 are pivoted or hinged as at 35 to the ears 25 and said pivot point 35 coincides with the joint between the end wall section 28 and the spacer strip 26 at the inside of the end wall in order to permit the end wall section 28 to be swung inward.

In a similar manner the lower ends of the metal bands or straps 34 are pivoted as at 36 to the ears 12 and said pivot points coincide with the joint between the riser 15 and the end wall section 29 at the inside of the end wall to also permit said end wall section 29 to be swung inward. If found desirable, said end wall sections may be connected with the bottom and top of the crate respectively, by additional hinges shown at 37 and 38.

The meeting ends of the straps or bands 33 and 34 are provided with outwardly projecting tongues or extensions 39 and are pivoted together as at 40, said pivot point coinciding with the joint between the two end wall sections at the outside of the end wall to permit each end wall to fold up or collapse as plainly illustrated in Figs. 2 and 6.

Other upright walls 41, which for purpose of description will be termed the side walls, are of a size to extend between the top and bottom of the crate as well as between both end walls and said side walls may be solid or may be of open work construction as herein shown in which case each end wall comprises top and bottom rails 42 and end rails 43 with suitable bars 44 between two of the rails as between the top and bottom ones. These side walls are hinged along their top edges to the side edges of the top of the crate so as to swing inward and up against the top of the crate as shown in Figs. 2 and 6, and for this purpose hinges 45 are provided and the pivot points of these hinges coincide with the point between the top rails of the side walls and the side rails of the top wall at the inside of the side walls.

In order to permit the side walls to be folded up until they lie flat against the underside of the top wall, the width of the crate must be at least twice the height of one of said side walls, and if this is not so, then said side walls are made foldable instead of the end walls as herein described. It should now be obvious that the spacer strips 26 must be of a height equal to the thickness of the side walls in order to provide spaces between the folded end walls and the top of the crate to accommodate the side walls when the latter are swung in and up against the top wall, but the spacer strip or riser 15 is utilized to space the folded end walls from the bottom of the crate so that said end walls can be folded in even though considerable foreign matter has accumulated on the inner surface of the bottom providing the accumulations do not rise higher than the upper edge of said risers 15.

It is to be particularly noted that the side edges of the bottom are practically unobstructed and therefore with the foldable end walls in upright positions and the side walls swung up against the top wall, easy access may be had to the top surface of the bottom for scraping or otherwise cleaning the same.

When the side walls are in the upright positions as shown in Figs. 1, 4 and 5, they will contact with the inner faces of the foldable end walls to prevent the same from being folded and in order to fasten said side walls in their operative positions, I provide the lower free edges of said side walls with suitable fasteners or bolts 46, one of which is illustrated in detail in Fig. 7. Each fastener preferably comprises a support 47 made from suitable relatively thin metal and fashioned to provide a pair of spaced bearings 48, one at each end and an intermediate bearing 49 offset from the other two and in these bearings is slidably mounted a substantially U-shaped bolt 50, one leg of which slides in the bearing 49 while the other leg slides in the bearings 48, but can be withdrawn from one of said bearings 48, but since said bolt cannot be withdrawn from the other bearing 48 or the bearing 49 there is no possibility of said bolt accidentally rotating.

When the bolt is withdrawn from one of the bearings 48, the space between said bearings 48 is left clear or unobstructed for registration with the keeper 14, and when in registration, the hole therethrough will align with the holes in the bearings 48 and the leg of the bolt can be passed through the keeper 14 for securely connecting the fastener to the keeper.

As before stated there are a number of fasteners on each side wall and therefore there are a number of coacting keepers, the additional keepers being represented by the numeral 14′ because they project from very short straps secured to the underside of the crate bottom, said keepers 14′ are preferably located near the ends of the bottom. The location of the latter keepers being in the path of travel of the metal bands or straps 34, the latter have notches 51 formed in their inner edges for registration with the keepers 14′ when the end walls are folded as plainly shown in Fig. 2.

Of course I do not wish to be limited to the exact details of construction herein shown and described as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is:—

1. A collapsible crate consisting of a bottom, metallic straps secured to the underface of said bottom at each end and the ends of said straps being turned up to form ears, a top, metal straps

secured to the outside of said top at the ends thereof with the ends of said straps turned downward to form ears, end walls each including two sections, metal straps secured to the ends of said sections, outwardly projecting extensions formed at the meeting ends of said last mentioned straps and overlapping each other, means to pivot said extensions together for hinging the sections of the end walls to each other, the pivots coinciding with the joint between the sections of each end wall at the outside thereof whereby said end walls may be folded inward, means to pivot the opposite ends of the straps carried by the end wall sections to the ears of the straps on the bottom and top of the crate, said last named pivots coinciding with the joints between the top and bottom of the crate respectively, on the inside of the end walls, and side walls hinged to the inside of the top so that they may be caused to assume a horizontal position or a vertical position against the inside of the top.

2. A collapsible crate comprising a bottom, a top, spacing strips secured to the top surface of the bottom at each end and to the under surface of the top at each end, metallic bands or straps secured to the under surface of the bottom of each end, ears formed from said straps and projecting upwardly above the spacing strips, other metallic bands or straps secured to the upper surface of the top at each end, ears formed from the ends of said straps and extending downwardly below the spacing strips on the top, end walls each including two similar sections one section being mounted above the other, metal straps at the ends of each section and pivotally connected to a contiguous ear at a point coinciding with a joint between an end wall section and the contiguous spacing strip at the inside of the end wall, extensions formed with the meeting ends of the straps on the end wall sections and pivoted to each other at a point coinciding with the joint between the sections of each end wall at the outside thereof, and side walls hinged to the underside of the top at each side thereof whereby they may be swung into parallelism with the top against the underside thereof or moved into vertical positions between the top and bottom.

3. The structure set forth in claim 2, in combination with keepers at the sides of the bottom, certain ones of which are in the path of travel of the straps on one of the sections on each end wall, said straps having notches formed in their edges for registration with such keepers when the end walls are folded and bolts carried by the sde walls for coacting with the keepers to hold said side walls in vertical positions.

WILLIAM K. KINGSLAND.