G. KLENK.

SHEET METAL BOX.

APPLICATION FILED APR. 17, 1911. RENEWED FEB. 13, 1917.

1,240,224.

Patented Sept. 18, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

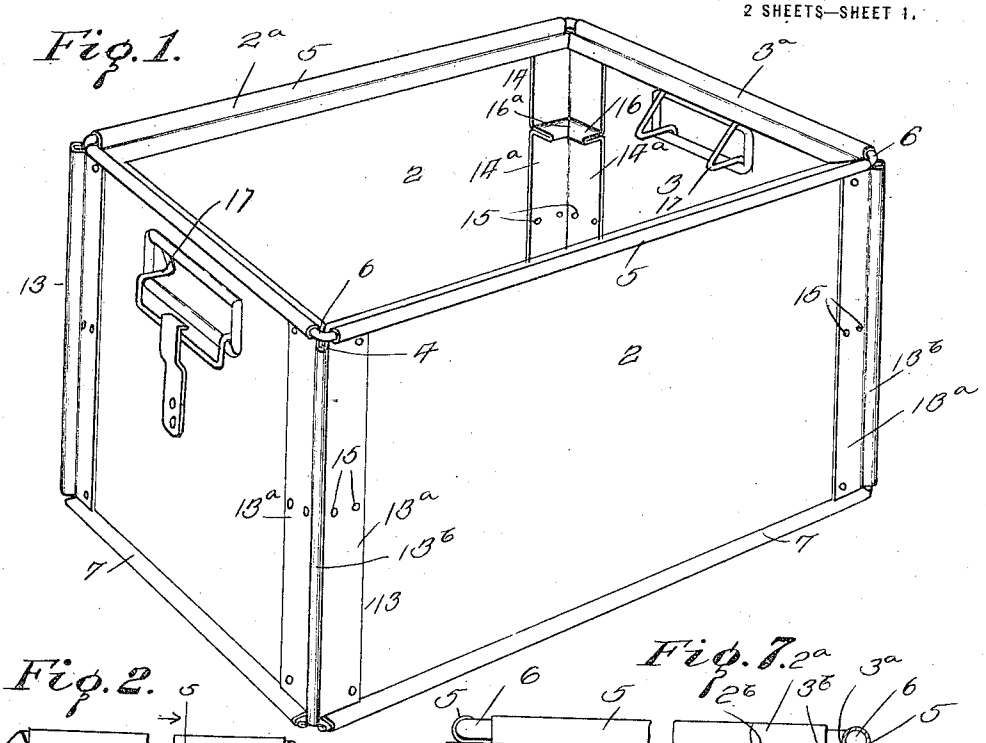


Fig. 2.

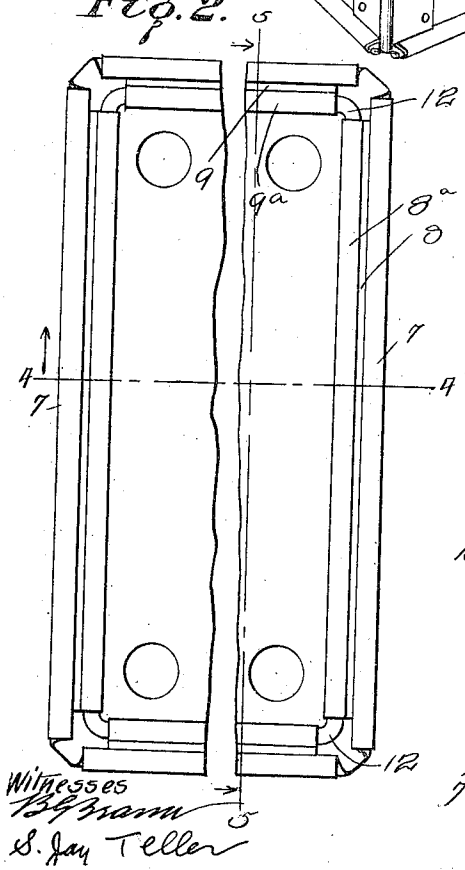
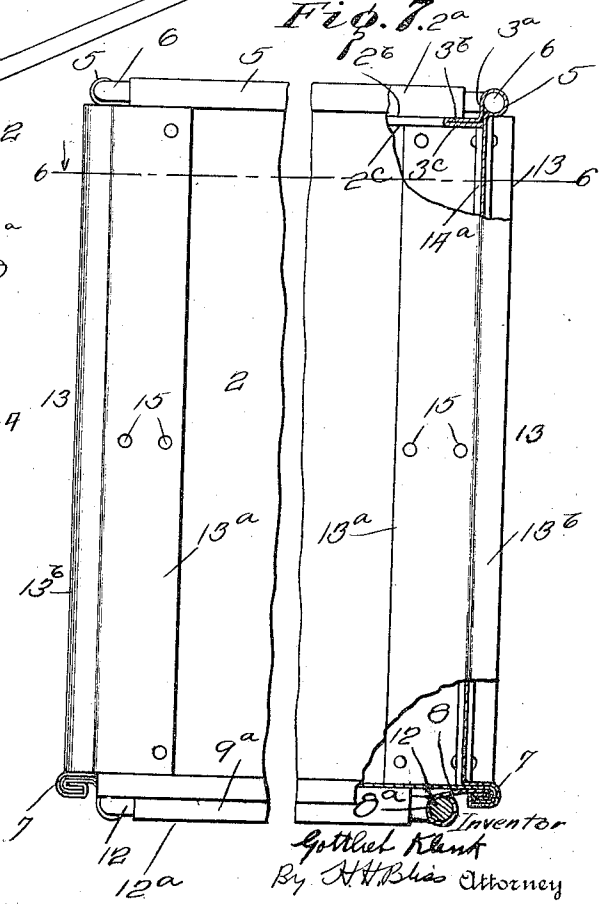


Fig. 3.



Witnesses
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2 SHEETS—SHEET 2.

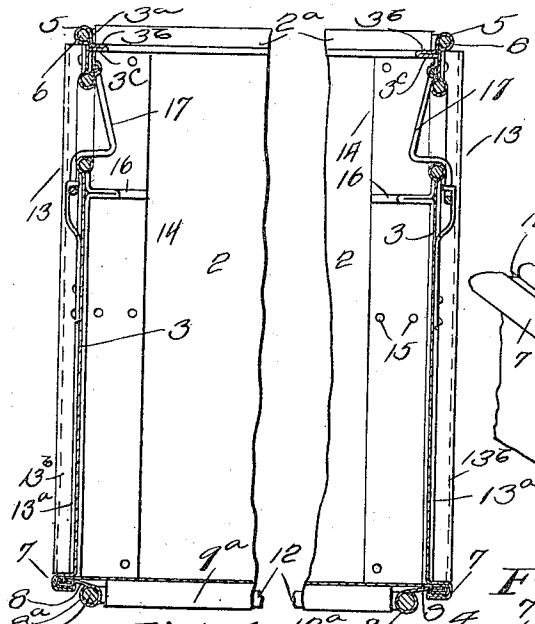


Fig. 4.

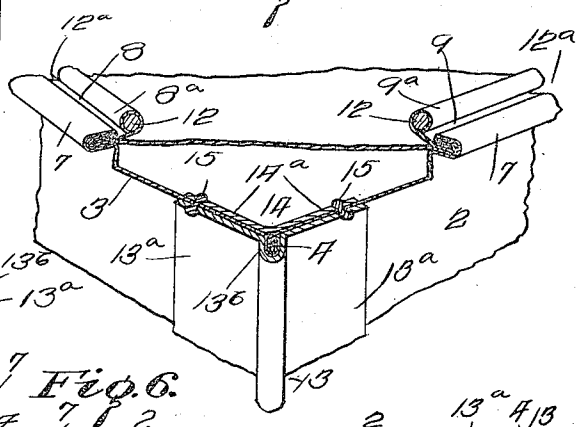


Fig. 6.

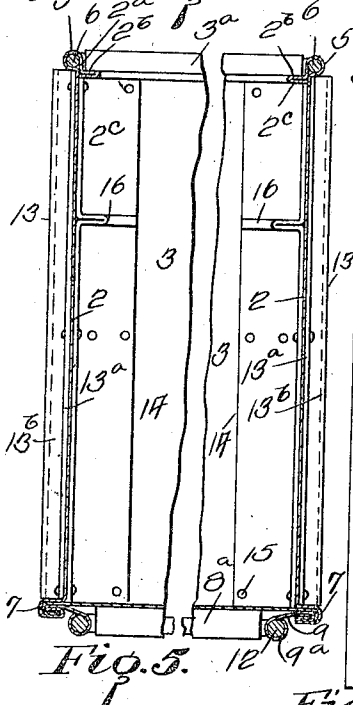


Fig. 5.

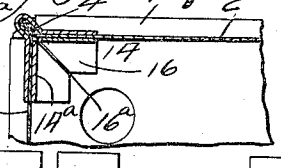
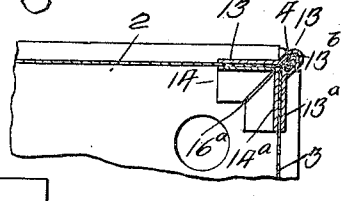


Fig. 7.



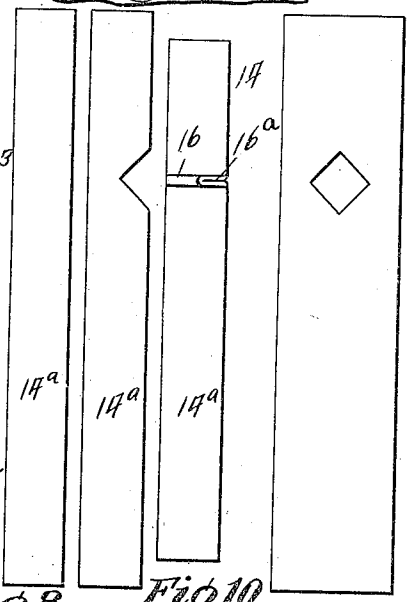


Fig. 8. Fig. 9. Fig. 10. Fig. 11.

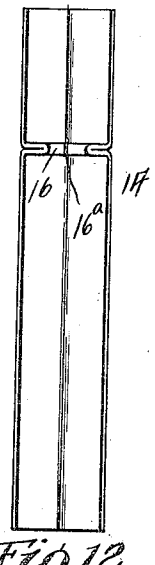


Fig. 12.

Witnesses

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UNITED STATES PATENT OFFICE.

GOTTLIEB KLENK, OF DEFIANCE, OHIO, ASSIGNOR TO THE DEFIANCE PRESSED STEEL COMPANY, A CORPORATION OF OHIO.

SHEET-METAL BOX.

1,240,224. Specification of Letters Patent. **Patented Sept. 18, 1917.**

Application filed April 17, 1911, Serial No. 621,683. Renewed February 13, 1917. Serial No. 148,416.

To all whom it may concern:

Be it known that I, GOTTLIEB KLENK, a citizen of the United States, residing at Defiance, in the county of Defiance and State of Ohio, have invented certain new and useful Improvements in Sheet-Metal Boxes, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in sheet metal boxes and cases of the class used for storing and transporting bottles which contain liquid; and pertaining more particularly to boxes of this general class which have their side walls and end walls formed of rectangular sections of sheet metal with their vertically arranged edges crimped or seamed together, these crimped or bent seams being the only fastening devices which are provided at the corners.

I have heretofore designed and have established as a largely used commodity sheet metal boxes so constructed and arranged at their tops and at their bottoms that the bottom part of one could rest upon the top part of the next and could interlock therewith so that it was not only provided with firm vertical support, but was held against lateral displacement. This was attained by having near the upper edges of the side and end walls an inwardly projecting flange, and directly at the said upper edges a series of sheet metal beads and a bracing wire therein, and forming the bottom so as to have an inset and downwardly projecting base part, together with an outwardly projecting horizontally arranged flange extending around the lower edges of the side and end walls. When the boxes are "stacked" one upon another, the downwardly projecting base part of one can rest more or less upon the aforesaid inwardly projecting flange near the upper edge of another, while at the same time the outwardly extending flange at the bottom of one can rest upon the bead and wire at the top edges of the other.

But it has been observed that the boxes, with the weight of their contents, have a tendency, when thus stacked one upon another, to severely strain the corner parts and bulge or force their seamed edges out of the firm union that is required; and also that the flanges (one at the upper part of the box projecting inward, and one at the lower edges projecting outward) are apt to be distorted under the severe strains to which they are subjected.

The present invention relates to devices for overcoming all of these objections and producting a box of greatly increased strength and durability in comparison with those that have been heretofore made.

Figure 1 is a perspective view of a box embodying my improvement.

Fig. 2 is a bottom plan view.

Fig. 3 is a sectional perspective view.

Fig. 4 is a longitudinal section on the line 4—4 of Fig. 2.

Fig. 5 is a cross section on the line 5—5 of Fig. 2.

Fig. 6 is a horizontal section on the line 6—6 of Fig. 7.

Fig. 7 is a side elevation partly broken away.

Fig. 8 is a face view of a sheet metal blank from which can be made one of the interior corner reinforces.

Fig. 9 shows the same after it has been notched or cut.

Fig. 10 shows it after it has been crimped to produce a reinforcing and supporting horizontal flange.

Fig. 11 shows a sheet metal blank for producing a modified interior corner reinforce.

Fig. 12 shows the same after it has been crimped and bent.

As above remarked the box is made of sections of sheet metal, 2, 2 indicating the side walls, and 3, 3 the end walls. The side sections and the end sections are crimped together to form the corner seams or flanges 4 which may be of the usual character. To them are incident the objections above referred to and these are obviated by the devices to be described. Near the upper edge of each end section and each side section there is a bead 5 which is so related in position as to extend outward from the vertical plane of the side walls and end walls, 6 is a bead rod or wire fitted in the beads 5 and extending around the top of the box. Beyond this bead the edge part of the sheet is turned vertically downward as at 2^a, 3^a, then inward as at 2^b, 3^b, and then outward as at 2^c, 3^c. The parts 2^b and 2^c and 3^b and 3^c lie in the same horizontal planes and consti-

tute an inwardly extending flange situated a short distance below the uppermost edges of the box.

At the lower edges the end walls and side walls are bent outward and then inward, together with other parts to be mentioned, to form a strong flange 7. Below the horizontal planes of this flange there is a strong base or support structure. It comprises heavy rods or wires 12 which are held in place by beads 8^a and 9^a formed upon bracing and carrying strips 8, 9, the outer edges of which are crimped with the metal of the end walls and side walls to form the aforesaid flanges 7.

The distance between the lowermost plane of this supporting base, indicated as an entirety by 12^a, from the lowermost plane of the flange at 7 is substantially equal to the distance from the top plane of the flanges 2^b, 3^b to the top plane of the beads 5. When the boxes are stacked one upon another, the base support 12^a rests more or less upon the flanges 2^b, 3^b at the top of the box below. And at the same time the flange at 7 rests upon the top of the beading at 5 of the lower box. The pressure downward upon the beading at 5, 6 is often so severe as to twist and distort it or, vice versa, to bend out of shape the flange part at 7, this being accompanied or caused by a corresponding crushing or distorting action at the corner seam or crimp 4.

To obviate these I employ a pillar-like brace, indicated as a whole by 13, to be more fully referred to.

At the same time, experience shows that the bottom or base element, represented as a whole by 12^a, of one box tends (particularly if the fit of one box upon another is not perfect) to bend or distort the parts of the flanges at 2^b, 3^b of another. To overcome this I have combined with the structure a pillar-like bracing element, indicated as a whole by 14.

The brace or pillar 13 is formed of a strip of sheet metal of sufficient width to provide two plates 13^a which are brought to right angles to each other, and also a loop or fold 13^b which incloses the corner crimp or seam 4 and furnishes a strong corner pillar. The plate parts 13^a, 13^a and the pillar 13^b are fitted snugly and tightly under the bead 5 and bead wire 6, and also abut strongly against the lower flange 7. And I have found that the blows and exertions of pressure downward resulting from the striking or bearing of the flange 7 of an upper box on the beads 5 of a lower one are met with such strength and resistance that the distorting of the corners of the box is entirely overcome under all ordinary circumstances.

Then to prevent disastrous results from the base part 12^a of one box striking or bearing severely downward upon the flange parts 2^b, 3^b of a lower box, I place on the interior faces of the side walls and end walls at each corner the pillar-like reinforce above referred to and indicated by 14. This may be also formed of a comparatively narrow sheet or strip of metal bent to have the plate parts 14^a at right angles to each other. It is fitted tightly against the under faces of the flanges at 2^b, 2^c and 3^b, 3^c, and also tightly against the bottom of the box or an abutment at that place. The outer pillar or reinforce 13 and the inner one 14 are solidly united to the sheet metal of the sides and the ends by means of rivets 15 of any required number. These corner reinforces can be made as shown in Figs. 11 and 12. The blank is cut as shown in Fig. 11 and then crimped or bent to form a horizontal flange part 16, and then bent along the central longitudinal line so as to bring the halves of the piece at substantially right angles to each other, as in Fig. 12. In some cases, however, I prefer to make this part 14 in two pieces of metal which can be understood as indicated by 14^a, 14^a, and crimp or bend each of them, as shown at 16 for the purpose of forming an inwardly extending flange on each, these flanges abutting together at the corner line 16^a.

In this case not only is there a bracing effected against the forcing of the two adjacent walls together at the corner, but a rest or shelf like device is provided upon which can be supported the retainer that is frequently used for holding the necks of the bottles or vessels in proper positions and for holding the bottles as entireties, in place. When such a retainer is employed a fastener, such as indicated by 17, can be used of any well known form.

The inside reinforces 14, 14 are arranged as nearly as possible in the vertical lines of the beads 8^a and 9^a and the bead wire 12 constituting the main parts of the bottom support of the base or structure.

As concerns the bottom, proper, of the box, it is to be noted that it can be made in any of the well known ways. It may be either closed, that is made of one or more approximately continuous sections of sheet metal; or it may be "open," that is to say, made of wires or rods for the bottles or vessels to rest upon, these to be secured in any suitable manner.

What I claim is:—

1. In a sheet metal box of the class described, the combination of end walls and side walls crimped together at their vertical edges, the walls being shaped at their upper edges to provide an outward projecting bead around the top of the box and to form an inward projecting stiffening and supporting flange below the said bead, and being shaped at their lower edges to provide an outward projecting box supporting flange

around the bottom of the box in vertical lines below the said bead, a downward projecting stacking flange at the bottom of the box positioned along lines within the said supporting flange, supplemental vertical pillar-like angle shaped reinforcing bars secured to the outer sides of the corners of the box, and engaging with the under side of the top bead and with the upper side of the bottom flange and inclosing the corner crimps, and supplemental vertical angle shaped reinforcing bars at the inner sides of the corners of the box, each extending to the bottom of the box and bearing against the under side of the said inward projecting flange near the top of the box, the said supplemental reinforcing bars at the outer and inner sides of the corners serving to strengthen the corners and to support the said bead and the said flanges against distortion when the box is subjected to pressure along vertical lines.

2. In a sheet metal box of the class described, the combination of end walls and side walls crimped together at their vertical edges, a bottom structure secured to the side and end walls, and vertical reinforcing bars secured to the inner sides of the box corners, the bars being angle shaped in horizontal cross section, and bent between their ends to form horizontal inward projecting shelves.

In testimony whereof I affix my signature, in presence of two witnesses.

GOTTLIEB KLENK.

Witnesses:
C. C. HOFFMAN,
HENRY NEWBEGIN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."