Dec. 15, 1942. O. W. WENTZ 2,305,364

CONTAINER CONSTRUCTION

Filed May 12, 1939 2 Sheets-Sheet 1

Fig. 1.

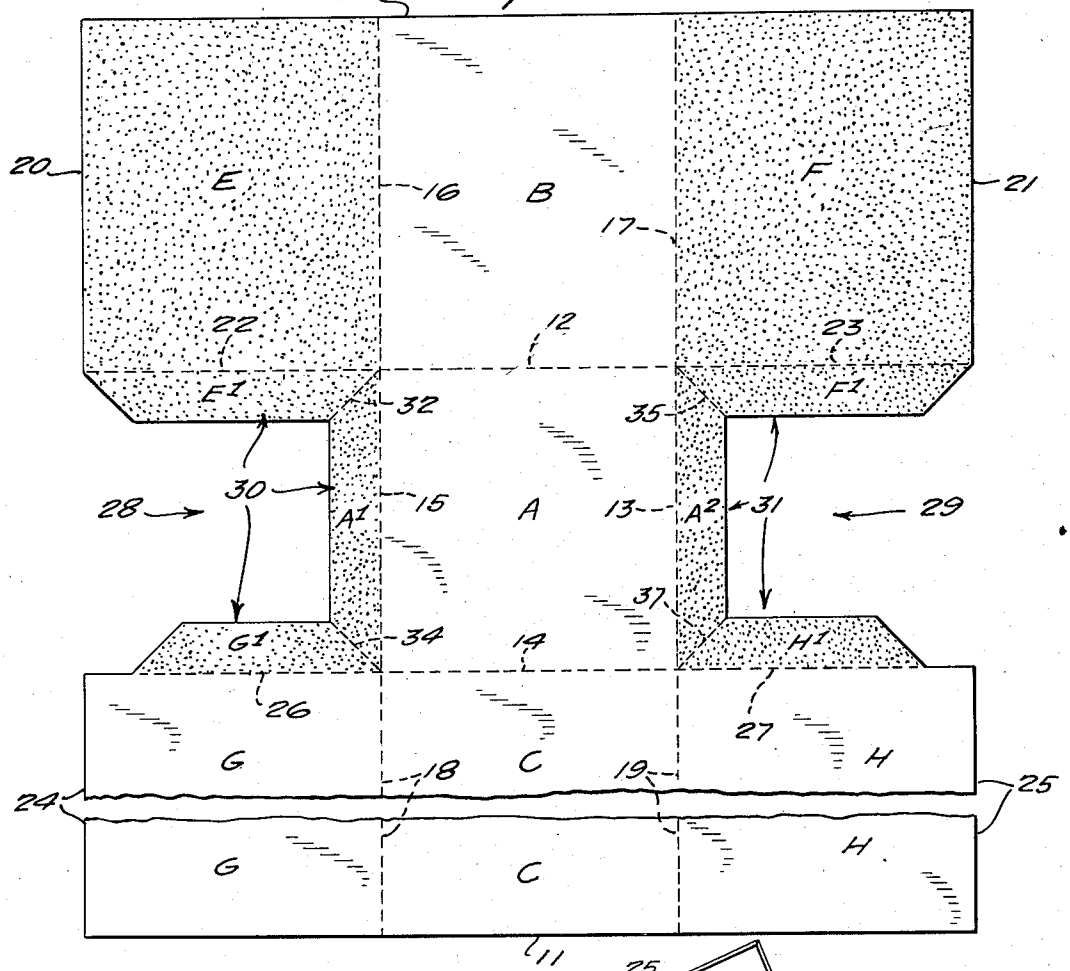
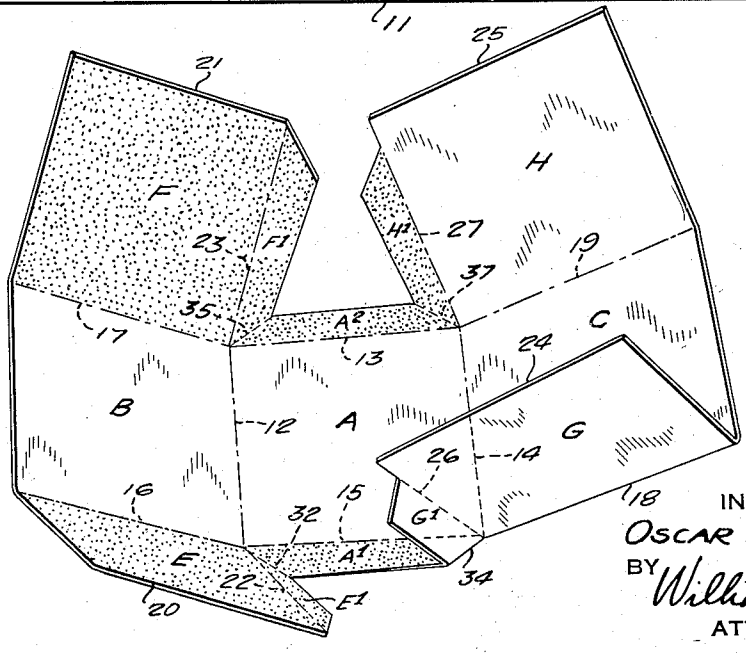


Fig. 2.



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Filed May 12, 1939 2 Sheets-Sheet 2

Fig. 3.

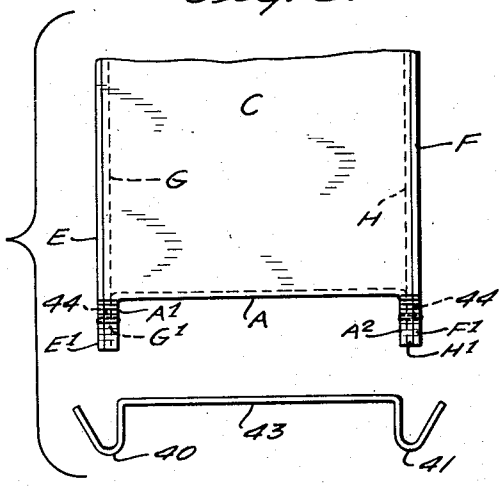


Fig. 4.

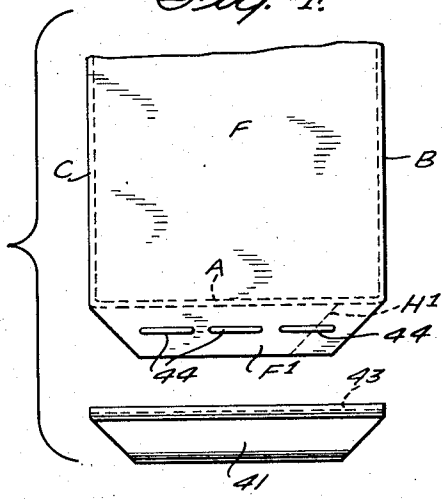


Fig. 5.

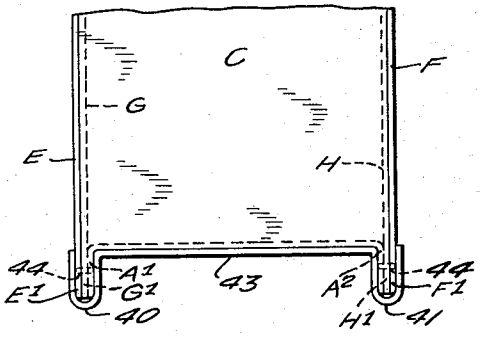


Fig. 6.

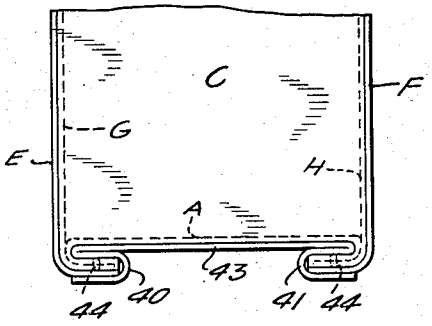


Fig. 7.

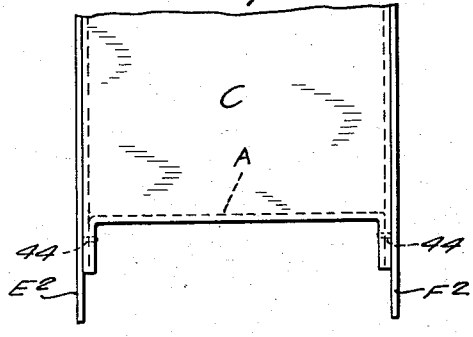
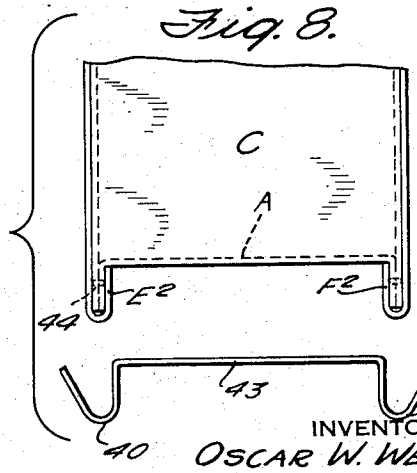


Fig. 8.



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2,305,364

CONTAINER CONSTRUCTION

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Application May 12, 1939, Serial No. 273,196

4 Claims. (Cl. 229—16)

This invention relates to container construction and more particularly to the construction of containers made of paper or like material.

One of the objects of this invention is to provide a simple, inexpensive and practical container construction of the above-mentioned character. Another object is to provide a container construction that will be strong and durable, economical in the use of paper or like material and capable of ready and inexpensive fabrication. Another object is to provide a container construction of paper or like material having a bottom construction capable of being dependably reinforced, as with sheet metal. Another object is to provide a container construction in which a dependable sealing of the bottom may be reliably and inexpensively achieved as by a clamping action. Another object is to provide a container construction of paper or like material having a bottom construction so strengthening and reinforcing the side walls and the container generally that, though relatively light sheet material is employed, the container will have a substantial load-carrying capacity and can reliably withstand the hazards incidental to its use and handling. Another object is to provide a container bottom construction that will be strong and durable and tight. Another object is to provide a container bottom construction in which the advantages of clamping members, such as sheet metal clamps, may be inexpensively and reliably achieved for effecting also tightness or sealing, durability, and reinforcement. Another object is to provide a blank out of which a container may be efficiently dependably and inexpensively formed. Other objects will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, arrangements of parts and in the several steps and relation and order of each of the same to one or more of the others, all as will be illustratively described herein, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings in which are shown the mechanical features of several of the possible embodiments of my invention,

Figure 1 is a plan view or development of a blank, certain parts being broken away or omitted, out of which a container may be formed;

Figure 2 is a perspective view showing the blank in the course of certain of the folding operations performed on it to form the container body;

Figure 3 is an end elevation of the container body showing also certain flap-securing means;

Figure 4 is a side elevation as seen from the right in Figure 3;

Figure 5 is an end elevation like that of Figure 3 showing one form of assemblage of the flap-securing means with the container;

Figure 6 is a view like that of Figure 5 showing another form of such assemblage;

Figure 7 is an end elevation of a modified form of container body in one stage of its construction, and

Figure 8 is a similar view showing the container body in another stage and also certain flap-securing devices that may be related thereto.

Similar reference characters refer to similar parts throughout the several views in the drawings.

Referring first to Figure 1 of the drawings, I have there shown a blank made of a single piece of suitable sheet material, such as paper, cardboard, or other appropriate fibrous, cellulose or like material, hereinafter termed for convenience, but not by way of limitation, paper. In Figure 1 an illustrative outline or shape of the blank is shown excepting for the upper and lower margins 10 and 11 which are indicated as being broken away in order to indicate that the portions of the blank beyond these marginal lines 10 and 11 may be given any shape or form depending upon the type of top closure which it is desired to employ, my present invention being not concerned with any particular type of top closure and it being sufficient to point out that any suitable form or type of which several are known in the art may be employed.

Substantially centrally of the blank are score lines 12, 13, 14, 15 outlining a quadrangular or four-sided bottom A which, for purposes of illustration, may be square. From the ends of the score line 12 there extend upwardly score lines 16 and 17 which, with the score line 12, outlines an end wall B. Score or fold lines 16, 17 are preferably parallel but, as understood in the art, may be made to be upwardly divergent to give the end wall B a tapered shape where the ultimate container is to be tapered so that it may be nested with others; it is therefore to be understood that my invention is not to be limited to either form.

In like manner, score lines 18 and 19 extend from the ends of the end edge or score line 14 of the bottom A and like the score lines 16, 17 are also shown as parallel; score lines 18, 14

and 19 encompass an end wall C that is ultimately to be juxtaposed to the end wall B.

End wall B has lateral extensions E and F which are to form portions, respectively, of two opposed side walls of the ultimate container and these extensions E and F may be and preferably are shaped as shown in Figure 1, as appears by the relationship between the score line 16 and the edge 20 of the blank and by the score line 17 and the edge 21 of the blank; the bottom boundaries of the extensions E and F are indicated by the score lines 22 and 23, respectively, the latter, where the container is to be tapered, extending at slight angles to the score line 12 of the bottom A.

In like manner end wall C has lateral extensions G and H which are to form portions of respective opposed side walls and, like the extensions E and F, they are preferably dimensioned and shaped to coincide with the dimensions and shapes of the ultimate side walls themselves. Extension G is laterally bounded by the score line 18 and the cut edge 24 of the blank while extension H is laterally bounded by the score line 19 and the edge 25 of the blank. The bottom boundaries of the extensions G and H are indicated by the score lines 26 and 27, respectively, the latter being straight-line extensions at slight angles from the score line 14 forming one edge of the bottom A where it is not desired to have the above-mentioned tapered shape of the ultimate container.

Accordingly, where the lateral extensions E, F, G and H are each, as in the preferred form, of the same shape as the respective side wall of which they are to form a part, the score lines 22 and 26 are of the same length as the score line 15 of the bottom A and score lines 23 and 27 are of the same length as the score line 13.

The blank is cut out, as at 28 and 29, the line of cutting preferably avoiding the score lines 22, 15 and 26, so far as the cut-out 28 is concerned and score lines 23, 13 and 27 so far as the cut-out 29 is concerned, thereby leaving U-shaped flaps 30 and 31. U-shaped flap 30 is broken up by score lines 32 and 34 which run diagonally to two corners, respectively, of the bottom A, thus forming flap-like extensions E^1, A^1 and G^1 of the areas or sections E, A and G, respectively. In like manner, the U-shaped flap 31 is broken up by diagonal score lines 35 and 37 to form flap-like extensions F^1, A^2 and H^1 of the container portions F, A and H, respectively. Preferably, flap extensions G^1 and H^1 are of lesser length than the flap portions A^1 and A^2, respectively, for reasons later set forth, and this may be achieved in the manner indicated in Figure 1.

In folding the blank of Figure 1 to form the container, adhesive is applied to the portions E, E^1, A^1 and G^1, and to the portions F, F^1, A^2 and H^1, it being noted that I am enabled to arrange the various parts so that the adhesive is applied only on one side of the blank, a feature achieving certain advantages in the construction and operation of the machines for forming the container, and in Figure 2 is indicated in perspective several of the various steps to which the blank is subjected in folding it up into a container body.

Thus, side wall portions G and H are swung about the fold lines 18, 19, respectively, to approximate a U-cross-section, and the resultant unit or section comprising the parts G, C and H, with the flaps G^1 and H^1 is then swung in counter-clockwise direction about the fold line 14 through substantially 90° to bring fold lines 27 and 13 and 26 and 15 into substantial coincidence, thereby bringing the adhesive-bearing faces of flaps H^1 and A^2 and of G^1 and A^1 into contact and registry, the above-described swinging action being accompanied by a downward swinging of the flaps A^1 and A^2 due to the connection of these flaps, at the fold lines 34 and 37 with the flaps G^1 and H^1, respectively.

During or subsequent to the above-described folding or swinging movements or actions, side wall portions E and F may be swung somewhat inwardly about the fold lines 16 and 17, respectively, and the portions E, B and F with the flap portions E^1 and F^1 then swung in clockwise direction about the fold line 12 as an axis, this latter movement being completed after the completion of the above-described 90° movement of the parts G, C and H; thereupon the side wall portions E and F are swung in a direction toward each other about the score lines 16 and 17 to bring their adhesive-bearing faces against the side wall portions G and H, respectively, the edges 24 and 25 of the parts G and H and the score lines 16 and 17 being brought into coincidence. Side wall portions F becomes secured to the portion H and side wall portion E becomes secured to the part G. But flap portion F^1 of the part F becomes laid against the outer face of the flap H^1 and against so much of the flap A^2 that is left uncovered by the flap H^1 where the latter, as in the preferred form, is made of lesser length than the flap A^2. In like manner flap portion E^1 becomes laid against and secured to the outer face of the flap G^1 and so much of the adhesive-bearing face of flap A^1 that is not completely covered by the flap G^1. These various folding operations are accompanied, as will be clear, by a folding of flap F^1 relative to flap A^2 about the score line 35, a like folding action taking place about the score line 32 with respect to the flaps E^1 and A^1. Suitable pressure-applying means is brought into operation to set the creases or folds and also to press together those parts between which an adhesive is interposed.

The resultant container body is shown in Figure 3 as it would appear from the right in Figure 2 upon the completion in the latter figure of the various operations above described, and it will be seen that there results two downwardly projecting composite flaps E^1, G^1, A^1 and F^1, H^1, A^2. In Figure 4 the structure is seen as viewed from the right in Figure 3. Because of the preferred shortening of the flap portions G^1 and H^1, an effect of which is indicated in Figure 4, I am enabled to insure that the closure and sealing at those corners where the fold lines 32 and 35 (Figure 2) appear is more dependable and secure and not made dependent upon the nature of the fitting of the diagonal ends of the flaps G^1 and H^1 into coincidence with the fold lines 32 and 35, respectively, though it will be understood that I achieve good results even without shortening these flaps.

For certain purposes and depending upon the nature of the sheet material or paper employed, particularly where it is relatively heavy, I may utilize the container in the form as it appears in Figures 3 and 4 or I may fold and secure the above-mentioned composite flaps preferably against the bottom A. However, and particularly where the container is constructed to withstand substantial stresses and strains and is made of quite heavy paper, I prefer to apply suitable fastening means to hold together and against separation the several elements of these composite

downwardly extending flaps. Preferably I employ U-shaped sheet metal clamping members **40** and **41** (Figures 3 and 4) into which these composite flaps are respectively received, suitable pressure being applied to force the arms or opposed parts of the U-shaped members **40** and **41** toward each other and hence dependably to clamp and hold the parts of the composite flaps against separation.

Preferably, and as shown in Figures 3 and 4, the clamping members **40** and **41** are connected together by a plate-like portion **43** and the three parts **40**, **43** and **41** are preferably made of a single piece of sheet metal or other suitable material, the plate-like portion **43** having an area commensurate with that of the under face of the bottom A.

In Figure 5 is shown the resultant container construction as it appears with the clamping members **40** and **41** applied and also, as in the preferred form, with the plate portion **43** integral therewith; by the plate portion **43** the bottom A is very substantially reinforced and strengthened and its load-carrying capacity or its resistance to strains and stresses greatly increased. Strains or loads imposed upon the bottom A may thus be transmitted to the bottom reinforcement **43** and by the latter to the U-shaped clamping members **40** and **41** and by the latter in turn to the two-layered side walls E—G and H—F, respectively. Preferably, also, the clamping of the U-shaped members **40** and **41** to their respective composite flaps is accompanied by indenting the sheet material of both arms of these U-shaped clamping members in any suitable manner and at appropriately distributed points so as to bite into the material of the composite flaps.

An additional feature of construction which I may achieve by making the parts **40**, **43** and **41** integral is shown in Figure 6 in which the two composite flaps with their attached U-shaped clamping members **40** and **41** are bent inwardly toward each other, as shown, and up against the under face of the bottom reinforcing plate portion **43**, this bending operation being accompanied by appropriate pressure application, as in vertical directions, to set the sheet metal and paper parts into the form shown in Figure 6.

The additional fold thus given the composite flaps insures further tightness of the seals or of the sealing between the individual flap portions of the composite flaps and also brings directly underneath the bottom reinforcing plate **43** the two U-shaped clamping members **40** and **41**, the latter, due to their configuration and clamping of the composite flaps, offering great resistance to bending and thus bringing about a stronger bottom construction than that of Figure 5 though it is to be noted that even in the latter the inherent resistance to bending of the sheet metal structure due to its conformation greatly strengthens the resultant structure.

Also, it will be noted that the structures of Figures 3, 5 and 6 dependably protect the bottom from contact with supporting surfaces or points in that the downwardly projecting composite flaps with or without the metal or like clamping or securing parts act in the nature of legs, or the like, for direct contact with a supporting surface and that in the constructions of Figures 5 and 6 these parts, covered preferably by metal, extend the excellent characteristics of the latter to cope with the wear and tear of contact and engagements of the container with a supporting surface. These features are particularly advantageous where the container is made, whether in large or small size, to contain materials, liquid or otherwise, of large weight per unit volume.

Under certain circumstances it may be desirable to provide the flap portions E^1 and F^1 with extensions E^2 and F^2, as shown in Figure 7; these extensions may be provided with adhesive at the same time that the flap portions E^1 and F^1 have the same applied thereto and these flap extensions E^2 and F^2 may be folded upwardly about the remaining flap portions of the otherwise composite flaps, as shown in Figure 8, thus forming a four-ply composite flap at each of the two sides of the bottom, and additionally sealing the junctions between the composite flaps. The resultant structure may be utilized in that form, the plies of the several composite flaps may be secured together, as by wire stitching, as indicated in Figure 8 at **44**, just as the composite flaps of Figures 3 and 4 may be secured together by stitching, preferably of wire, as indicated at **44** in those figures or, if desired, may have applied thereto clamping members **40** and **41**, preferably with an integral bridging and bottom reinforcing part **43** which may be with the composite flaps treated as described above in connection with Figures 5 or 6.

Thus, it will be seen that there has been provided in this invention a container construction and method of achieving the same in which the several objects hereinbefore set forth, together with many thoroughly practical advantages, are successfully achieved. The construction will be seen to be practical, inexpensive, easy to fabricate and strong and durable, being well adapted to meet the hardest and the varying conditions of practical use.

As many possible embodiments may be made of the mechanical features of the above invention and as the art herein described might be varied in various parts, all without departing from the scope of the invention, it is to be understood that all matter hereinabove set forth, or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A paper container made of a single sheet and comprising a four-sided bottom, two opposed sides of which are extended to form opposed end walls, said end walls each having lateral extensions respectively overlapped to form two side walls, each pair of overlapped lateral extensions having flap extensions connected with a flap extension of one of the remaining two sides of said bottom, the three flap extensions at each of said remaining sides of the bottom being overlapped and extending downwardly below the plane of the bottom to lie substantially in the plane of an adjacent side wall, and means clampingly embracing said three flap extensions so as to both secure the flaps thereof together and hold said three flap extensions in the aforesaid extended positions, whereby to form supports for the container adapted to offset the bottom thereof from a surface upon which the container is stood.

2. A paper container made of a single sheet and comprising a four-sided bottom, two opposed sides of which are extended to form opposed end walls, said end walls each having lateral extensions respectively overlapped to form two side walls, each pair of overlapped lateral extensions having flap extensions connected with a flap extension of one of the remaining two sides of said bottom, the three flap extensions at each of said remaining sides of the bottom being

overlapped and extending downwardly below the plane of the bottom, and means for securing together the three overlapped flap extensions of each of said two sets comprising a sheet metal plate resting against said bottom and having at two opposed ends U-shaped clamping portions in which said two sets are respectively received and clamped.

3. A paper container made of a single sheet and comprising a four-sided bottom, two opposed sides of which are extended to form opposed end walls, said end walls each having lateral extensions respectively overlapped to form two side walls, each pair of overlapped lateral extensions having flap extensions connected with a flap extension of one of the remaining two sides of said bottom, the three flap extensions at each of said remaining sides of the bottom being overlapped and extending downwardly below the plane of the bottom, and means for securing together the three overlapped flap extensions of each of said two sets comprising a sheet metal plate resting against said bottom and having at two opposed ends U-shaped clamping portions in which said two sets are respectively received and clamped, each of said U-shaped clamping portions with its clamped flap extensions being bent inwardly toward each other and against the under face of said sheet metal plate.

4. A paper container made of a single sheet and comprising a four-sided bottom, two opposed sides of which are extended to form opposed end walls, said end walls each having lateral extensions respectively overlapped to form two side walls, each pair of overlapped lateral extensions having flap extensions connected with a flap extension of one of the remaining two sides of said bottom, the three flap extensions at each of said remaining sides of the bottom being overlapped and extending downwardly below the plane of the bottom, and means for securing together the three overlapped flap extensions of each of said two sets comprising a sheet metal plate resting against said bottom and having at two opposed ends U-shaped clamping portions in which said two sets are respectively received and clamped, each of said U-shaped clamping portions with its clamped flap extensions being bent so that each makes an angle with the plane of said bottom.

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