

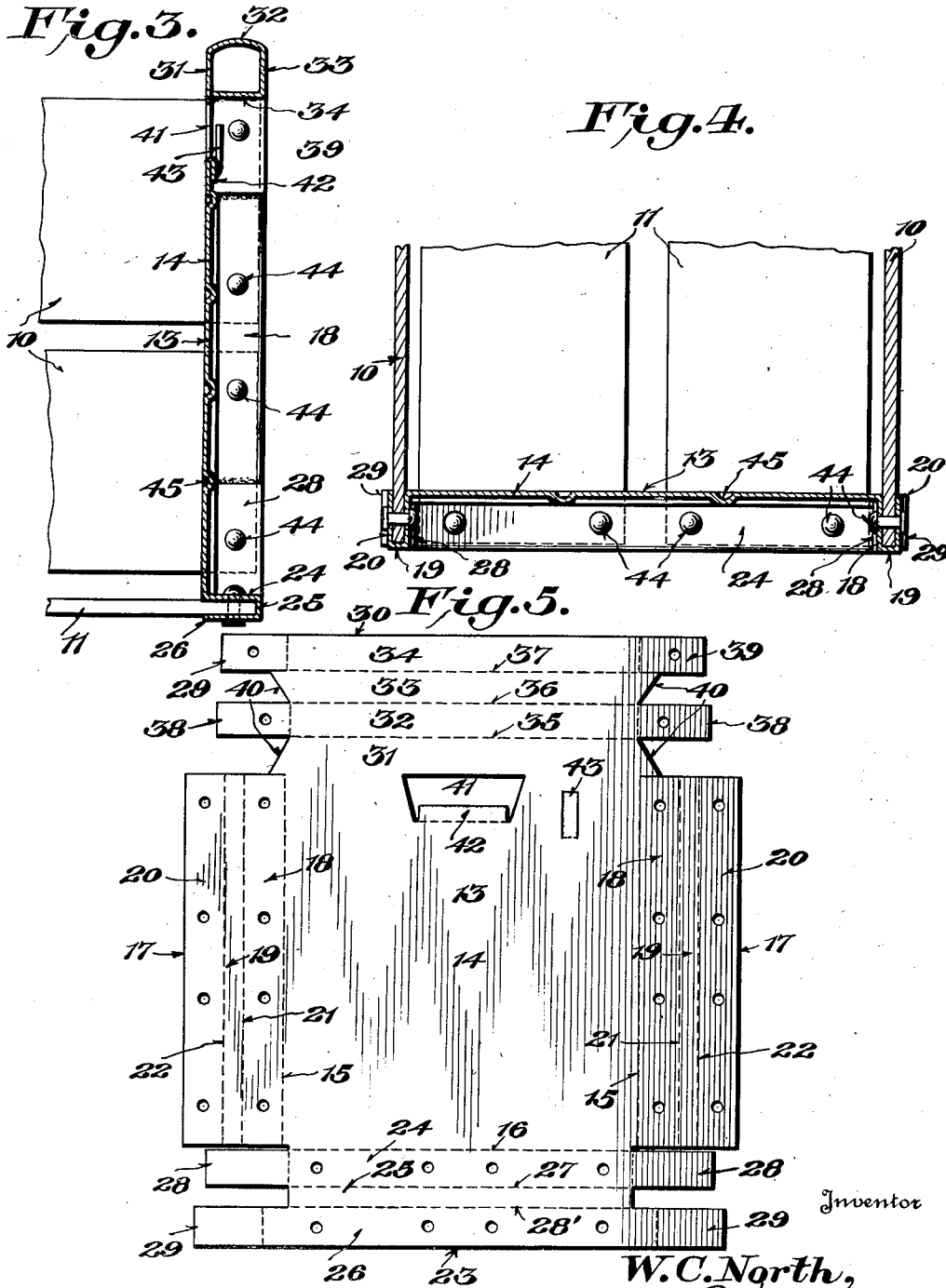
Nov. 13, 1934.

W. C. NORTH

1,980,545

CONTAINER STRUCTURE

Original Filed Aug. 24, 1931 3 Sheets-Sheet 2



Inventor

W.C. North,

384

R.P. Wolhaupter
Attorney

Nov. 13, 1934.

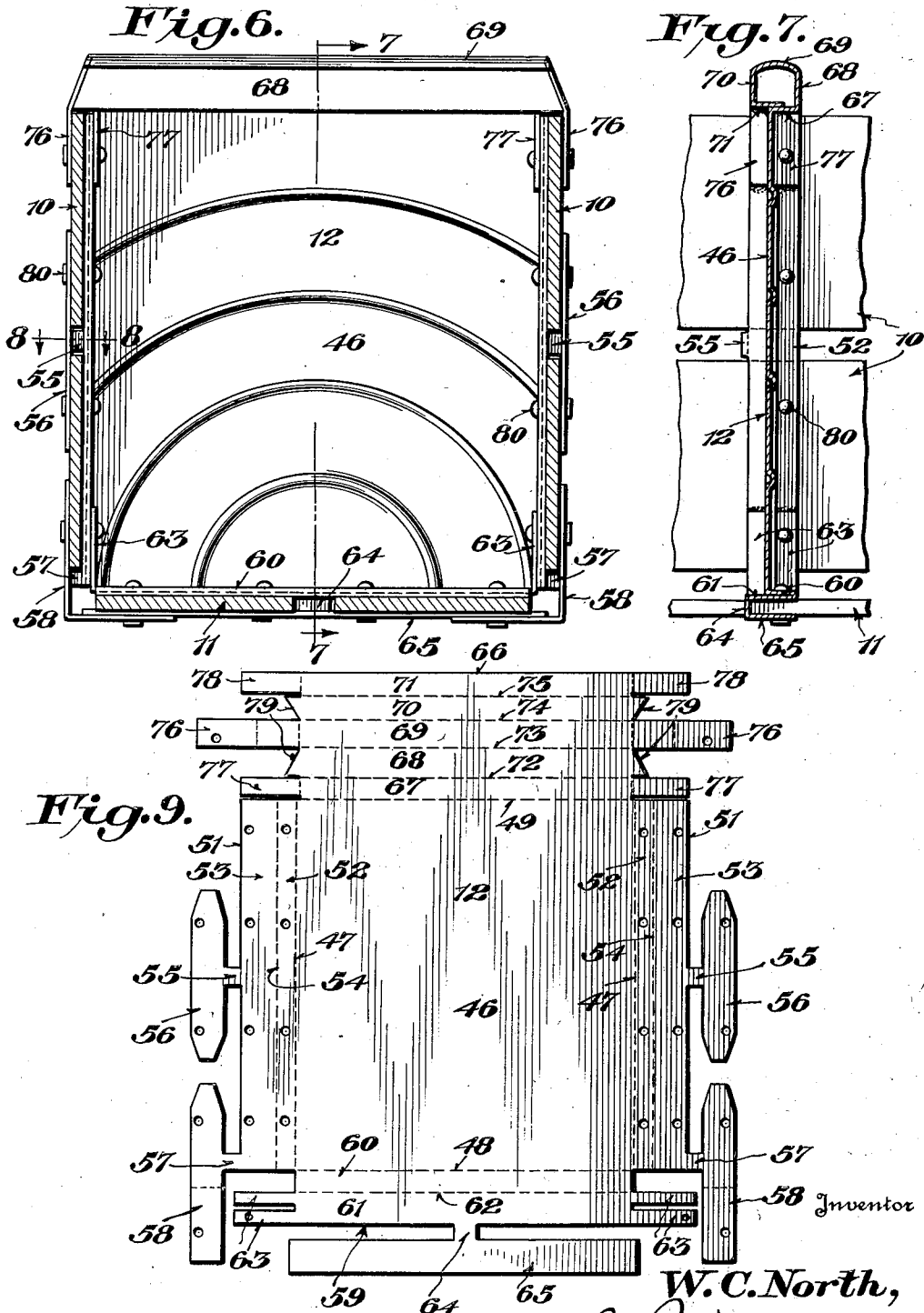
W. C. NORTH

1,980,545

CONTAINER STRUCTURE

Original Filed Aug. 24, 1931

3 Sheets-Sheet 3



Inventor

W. C. North,

D. P. Woelhaefer
Attorney

UNITED STATES PATENT OFFICE

1,980,545

CONTAINER STRUCTURE

William C. North, Sebring, Fla.

Application August 24, 1931, Serial No. 559,033

Renewed April 9, 1934

10 Claims. (Cl. 217—36)

This invention relates to improvements in shipping or storage containers such as field crates, packing crates, shipping and storage boxes and the like, and has generally in view to provide novel sheet metal end wall and partition elements for containers of various different types which elements are relatively cheap and easy to produce and to assemble with other container elements, and which serve, when embodied in a container, to impart thereto exceptional strength and durability.

A special object of the invention is to provide sheet metal end wall and partition elements which may be stamped or otherwise economically produced in the form of one piece blanks so as to occupy only a minimum amount of storage or shipping space, and which may readily be set up and assembled with other container elements in the field.

Another special object of the invention is to provide sheet metal end wall and partition elements embodying a novel construction whereby the different parts thereof serve to reinforce and stiffen one another, and whereby other parts of a container, such as the side and bottom walls thereof, may be expeditiously and firmly secured to said elements.

With the foregoing and various other objects in view, which will become more fully apparent as the nature of the invention is better understood, the same consists in the novel features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings and defined in the appended claims.

In the drawings, wherein like characters of reference denote corresponding parts in the different views:

Figure 1 is a perspective view of a container in the form of a field crate equipped with sheet metal end walls and a central transverse partition element constructed in accordance with the invention.

Figure 2 is an end elevation of the container.

Figure 3 is a vertical section on the line 3—3 of Figure 2.

Figure 4 is a horizontal section on the line 4—4 of Figure 2.

Figure 5 is an elevation of one of the end wall blanks.

Figure 6 is a transverse section on the line 6—6 of Figure 1 showing the partition element in elevation.

Figure 7 is a vertical section on the line 7—7 of Figure 6.

Figure 8 is a detail cross section on the line 8—8 of Figure 6; and

Figure 9 is an elevation of the partition element blank.

By particular reference to Figure 1 of the drawings, it will be observed that the improvements constituting the invention have been illustrated as embodied in a field crate of well known general design. It is to be understood, however, that the selection of a field crate for purposes of illustrating the invention is purely arbitrary and that the improvements are equally as readily capable of embodiment in various other different types of containers. Accordingly, the crate illustrated will hereinafter be referred to as a container, and by this term it is meant to include a container of any type with which either end walls or a partition element constructed in accordance with the invention are or is adapted for use.

Referring to the particular embodiment of the invention illustrated in the present instance, it will be observed that the container is inclusive essentially of a pair of side walls 10, 10, a bottom wall 11, a medial transverse partition element constructed in accordance with the invention and designated generally as 12, and a pair of duplicate end closure elements also constructed in accordance with the invention and designated generally as 13, 13.

As the end closure elements are duplicates of each other only one of the same is illustrated in detail and requires a detail description. Thus, referring particularly to Fig. 5, it will be observed that the sheet metal blank constituting the end closure illustrated in said figure comprises a central rectangular portion 14 corresponding in height and width to the height and width of the container and defined at its sides by the lines of fold indicated by the dotted lines 15, 15 at its bottom by the line of fold indicated by the dotted line 16, and at its top by an imaginary line connecting the upper ends of the lines 15, 15.

At each side of the central portion 14 and co-extensive in height with said portion, is a wing 17 of any suitable or desired width composed of three separate sections designated as 18, 19 and 20, respectively, separated by the lines of fold indicated by the dotted lines 21 and 22. The inner and the outer of these sections, 18 and 20, respectively, are of canal width, while the middle sections 19, approximate in width the thickness of the side walls 10, 10 of the container.

At the bottom of the central portion 14 is a

5
10
15
20
25
30
35
40
45
50
55

60
65
70
75
80
85
90
95
100
105
110

wing 23 which wing proper is coextensive in length with the width of said central portion and of the same width as the wings 17, 17. This bottom wing 23 like the wings 17, 17 is composed of three separate sections designated as 24, 25 and 26, respectively, separated by the lines of the fold indicated by the dotted lines 27 and 28, and said sections correspond in width, respectively, to the width of the side wing sections, 18, 19 and 20, the medial bottom section 25 approximating in width the thickness of the bottom wall 11 of the container. At each end of the section 24 is a tongue 28 formed as an end extension of said section and preferably of equal width therewith, while at each end of the section 26 is a tongue 29 likewise formed as an end extension of said section and preferably of equal width therewith.

At the top of the central rectangular portion 14 of the blank is a wing or extension 30, and this wing proper, like the wing 23 proper, is coextensive in length with the width of said central portion 14. This top wing 30 is composed of four separate sections designated as 31, 32, 33 and 34, respectively, separated by the lines of fold indicated by the dotted lines 35, 36 and 37, and while the sections 31 and 33 may be of any suitable width, they are of the same width as each other. On the other hand, the sections 32 and 34 are of substantially the same width as each other and of approximately equal width to the side wing sections 18 and 20 and the bottom wing sections 24 and 26. At each end of the section 32 is a tongue 38 formed as an end extension of said section and preferably of equal width therewith, while at each end of the section 34 is a tongue 39 likewise formed as an end extension of said section and preferably of equal width therewith. In addition, at the ends of the sections 31 and 33 are short extensions 40 of triangular shape, the outer edges of which extend diagonally outward with respect to the section 32 as shown.

Formed in the central rectangular portion 14 of the blank is an opening 41 of substantially rectangular shape located preferably midway between the sides of said central portion and having its upper limiting edge disposed substantially in alinement with the upper edges of the side wings 17, 17, while at the bottom of said opening is formed a tongue 42 adapted to be bent over upon either the inner or the outer face of the central portion to avoid a sharp edge at the bottom of the opening. If desired, similar tongues may be provided at the ends of the opening to be bent in the same manner to avoid sharp edges at these points. Furthermore, at some suitable point in the central portion 14 is provided a U-shaped slit forming a tongue 43 which is adapted to be bent slightly outward as shown in Figure 1 to constitute a holder for a data card of any desired type.

To form the blank illustrated in Figure 5 into an end closure, the sections 18 of the wings 17 are bent along the lines of fold 15 to extend outwardly at right angles to the central portion 14, the sections 19 are bent along the lines of fold 21 to extend outwardly at right angles to the sections 18, and the sections 20 are bent along the lines of fold 22 to extend inwardly at right angles to the sections 19 in parallel spaced relation to the sections 18, respectively. Thus, an inwardly opening formation of channel or U-shaped cross section is provided at each side of the central portion 14, and as clearly illustrated

in Figure 4 of the drawings, these channel formations are adapted for the reception of the end portions of the container side walls 10. Similarly, the section 24 of the bottom wing 23 is bent along the line of fold 16 to extend outwardly at right angles to the central portion 14, the section 25 is bent along the line of fold 27 to extend outwardly at right angles to the section 24, and the section 26 is bent along the line of fold 28 to extend inwardly at right angles to the section 25 in parallel spaced relation to the section 24. Thus, an inwardly opening formation of channel or U-shaped cross section is provided at the bottom of the central portion 14 for the reception of the end portions of the container bottom wall as clearly illustrated in Figure 3 of the drawings.

During forming of the wings of the blank into the channel formations described, the tongues 28 are bent to lie against the inner faces of the sections 18, and the tongues 29 are bent to lie against the outer faces of the sections 20 in the manner clearly shown in Figure 2 of the drawings, and subsequently said tongues preferably are spot welded to said sections 18 and 20, respectively, to afford an exceptionally strong and rigid corner structure.

The end portions of the container side and bottom walls may be secured within their related channel formations of the end closure in any suitable or desired manner. Preferably, however, they are secured within said formations by rivets or other fasteners 44 extending through the side walls of the respective channel formations, certain of the fasteners extending also through the tongues 28 and 29 to further assist in securing said tongues rigidly against the sections 18 and 20.

The wing 30 is adapted to be bent to provide a hollow stiffening and reinforcing formation as well as a handle at the top of the end closure, and to this end the section 32 is bent outwardly along the line of fold 35 at right angles to the section 31 which remains in the plane of the central portion 14, the section 33 is bent downwardly, along the line of fold 36 at right angles to the section 32 and in spaced parallelism to the section 31, and the section 34 is bent inwardly along the line of fold 37 at right angles to the section 33 and in spaced parallelism to the section 32, the free edge of said section 34 thus abutting the outer face of the section 31 at the bottom of the latter and preferably being subsequently spot welded thereto.

When the sections 31, 32, 33 and 34 are bent in the manner described, it is apparent that the triangular tongues 40 at the ends of the sections 31 and 33 serve to overlie the upper ends of the side channel formations and to provide downwardly sloping side wall ends at the ends of the hollow reinforcing and handle formation at the top of the closure element. In this connection it will be noted by reference to Figure 2 of the drawings that the tongues 38 at the ends of the section 32 are bent downward to close the ends of said hollow formation and that said tongues are extended into the channel formations at the sides of the end closure, although they may, alternatively, be extended downwardly against the outer faces of the sections 20 of said formations. Also, it will be noted that the tongues 39 are bent downwardly to lie against the inner faces of the side channel sections 18, although these tongues, like the tongues 38, may be extended downwardly into the side channel for-

mations. In either event, welded joints preferably are provided between the tongues 38, 39 and the side channel formations and also along the abutting edges of the tongues and the sloping end edges of the sections 31 and 33.

By reason of the top of the opening 41 being disposed in the plane of the bottom wall 34 of the hollow formation at the top of the end closure, it obviously follows that the medial portion of said formation constitutes a handle for facility in handling of the container. It is moreover apparent that a one piece sheet metal end closure formed in the manner shown and described is exceptionally strong and durable and that it may, if desired, be reinforced by ribs 45 rolled or pressed therein and arranged as illustrated in the drawings or in any other suitable or desired manner.

Referring now to the sheet metal partition element 12 illustrated in Figures 1 and 6 to 9, and which is especially designed for use in connection with containers of the type shown in which the side and bottom walls of the container are composed of spaced slots, it will be observed that said partition element is formed from a one-piece sheet metal blank in the same general manner as the end closures 13, 13. In other words, referring particularly to Figure 9 of the drawings, wherein is illustrated the partition element blank, it will be observed that said blank is inclusive essentially of a central rectangular portion 46 corresponding in height and width to the height and width of the container and defined at its sides by the lines of fold indicated by the dotted lines 47, 47, at its bottom by the line of fold indicated by the dotted line 48, and at its top by the line of fold indicated by the dotted line 49.

At each side of the central portion 46 and coextensive in height therewith is a wing 51 composed of two sections designated as 52 and 53 separated by the line of fold indicated by the dotted line 54, the inner sections 52 approximating in width one-half of the width of the outer sections 53, respectively. At a medial point along the length of each section 53 is an outwardly directed tongue 55 approximating in width the distance between the slots of the container side walls, and, as shown, each of said tongues serves as a connecting member between the related section 53 and a formation 56 which is somewhat elongated in the direction of the height of the partition element and of a width approximating the width of the sections 53. In addition, a tongue 57 extends outwardly from each section 53 directly adjacent to the bottom edge thereof and serves as a connecting member between the related section 53 and a formation 58 which also is elongated in the direction of the height of the partition element and of a width approximating the width of the sections 53. As shown, the lower portions of said formations 58 extend downwardly beyond the lower edge of the central portion 46.

At the bottom of the central portion 46 is a wing 59 which wing proper is coextensive in length with the width of said central portion and is composed of the two sections 60 and 61 separated by the line of fold indicated by the dotted line 62, said sections 60 and 61 being of equal width, respectively, to the side wing sections 52 and 53. At each end of the section 61 is a split tongue 63, while medially of said section is a downwardly extending tongue 64 which serves as a connecting member between said sec-

tion and a formation 65 corresponding in length and width to said section.

At the top of the central portion 46 is a wing 66 which wing proper, like the wing 59, is coextensive in length with the width of said central portion. This wing 66 is composed of fixed sections designated as 67, 68, 69, 70 and 71 separated by the lines of fold indicated by the dotted lines 72, 73, 74 and 75, the sections 68 and 70 being of any desired width and approximately the same width as each other, and the sections 67 and 71 being of approximately the same width as each other and approximately one-half the width of the section 69. At each end of the section 69 is a tongue 76 of suitable length and of approximately equal width to said section, while at each end of the section 67 is a tongue 77 and at each end of the section 71 is a tongue 78, these tongues 77, 78 likewise being of any suitable length and approximately of the same width as their related sections 67, 71, respectively. In addition, at each end of each of the sections 68 and 70 is a short extension 79 of triangular shape the end edges of which extend diagonally outward relative to the section 69.

To form the blank illustrated in Figure 9 into the partition element illustrated in Figures 1 and 6 to 8, the side sections 52 are bent along the lines of fold 54 at right angles to the central portion 46 to either side of said central portion and the sections 53 are reversely bent along the lines of fold 51 directly against the sections 52, respectively, as clearly illustrated in Figure 8 of the drawings. Thus, reinforcing and stiffening flanges are provided at the sides of the central portion for engagement with the inner faces of the container side slats, and due to the sections 53 being approximately twice the width of the sections 52 it follows that the central portion 46 is disposed in a plane approximately medially of said flanges.

The sections of the bottom wing 59 are bent in the same way as the sections of the side wings. That is to say, the section 60 is bent along the line of fold 48 at right angles to the central portion 46 to the same side thereof as the side sections 52, and the section 61 is reversely bent along the line of fold 62 directly against the section 60 as clearly illustrated in Figure 7. Thus, there is provided at the bottom of the central section a reinforcing and stiffening flange duplicating the flanges at the sides of said central portion and adapted for engagement with the inner faces of the container bottom slats.

To dispose the formations 56 in operative relation to the flanges at the sides of the central portion 46, the tongues 55 are bent at their junction with the sections 53 at right angles to said sections and the formations 56 are bent at their junction with said tongues at right angles thereto to overlie the side flanges in spaced relation thereto, the tongues being adapted to extend through the spaces between the side slats of the container as shown to permit the formations 56 to lie flat against the outer faces of said slats. In this connection it is apparent that said formations 56 may be bent into operative position either prior to or following assembly of the partition element with the container.

To dispose the bottom formation 65 in operative relation to the bottom flange of the partition element, the tongue 64 is bent at its junction with the section 61 at right angles to said section, and the formation 65 is bent at its junction with said tongue at right angles thereto into

underlying relation to the bottom flange. Thus, the tongue 64 is adapted to extend through the space between the container bottom slats and the formation 65 is adapted to engage the outer faces of said slats as best illustrated in Figs. 6 and 7. In this connection it will be noted that the tongues 63 at the ends of the bottom section 61 are bent upwardly to lie against the inner faces of the side flanges to either side of the central portion 46 as permitted by the splitting of said tongues, although, alternatively, said tongues may be of one-piece design and may extend upwardly between the side sections 52 and 53, as is obvious.

The formations 58 are bent in the same manner as the formations 56 to cause the upper end portions thereof to lie against the outer faces of the container side slats, while the bottom portions of said formations are bent inwardly to underlie the bottom formation 65 as clearly illustrated in Fig. 6 of the drawings. Spot welding is employed at suitable points where the various different parts of the partition element overlie or engage one another to secure parts in operative relationship, and in addition fastening elements such as rivets 80 are extended through the side and bottom flanges, the side and bottom slats of the container and the formations 56, 58 and 65, as well as the tongues 63, to further assist in imparting strength and rigidity to the structure considered as a whole.

The sections of the top wing 66 are adapted to be bent to form a hollow reinforcement at the top of the partition element, and to this end the section 67 is bent along the line of fold 49 at right angles to the central portion 46 preferably to the same side of said central portion as the side and bottom sections 52 and 60, the section 68 is bent upwardly along the line of fold 72 at right angles to the section 67, the section 69 is bent along the line of fold 73 across the top of the central portion 46 in spaced relation to the section 67, the section 70 is bent downwardly along the line of fold 74 at right angles to the section 69 and parallel to the section 68, and the section 71 is bent inwardly at right angles to the section 70 either against the central portion or in overlying relation to the section 67 as shown in Fig. 7 and secured preferably by spot welding. It will thus be observed that the triangular formations 79 at the ends of the sections 68 and 70 extend outwardly to overlie the upper edges of the container side walls, and in this connection it will further be observed that the tongues 76 are bent downwardly against the end edges of the sections 68 and 70 and into engagement with the outer faces of the container side walls. Moreover, the tongues 77 and 78 are bent downwardly into engagement with the inner faces of the partition side flange elements, to which they are spot welded. Spot welding also is employed preferably to fasten the tongues 76 to the ends of the sections 68 and 70, and in addition certain of the rivets 80 are extended through the tongues 76 and 77 to enhance the strength of the top part of the partition element.

Like the end closure elements, the partition element may be additionally reinforced and stiffened by means of suitably arranged ribs rolled or pressed into said element.

While the present end wall and partition elements have been illustrated and described in connection with a field crate, it is obvious that the top portion of said elements may be formed similarly to the sides or the bottom thereof in

any instance where said elements are intended for use with a container having a top closure, and that the top closure may, therefore, be assembled with the end elements or the partition element, or with both, in substantially the same manner as the side and bottom walls of the container.

Without further description, it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:

1. A container comprising side and bottom walls, and one-piece sheet metal end closures, each end closure comprising a central portion of substantially the same height, and width as the container, channel formations at the sides and the bottom of said central portion receiving the ends of the side and bottom walls, respectively, and tongues formed as end extensions of certain of the walls of certain of said channel formations, said tongues being secured in reinforcing engagement with certain of the walls of certain of the other channel formations.

2. A container comprising side and bottom walls, and one-piece sheet metal end closures, each end closure comprising a central portion of substantially the same height and width as the container, channel formations at the sides and the bottom of said central portion receiving the ends of the side and bottom walls, respectively, and tongues formed as end extensions of the bottom channel formation bent upwardly into engagement with and secured against the inner and the outer faces, respectively, of the side channel formations.

3. A container comprising side and bottom walls, and one-piece sheet metal end closures, each end closure comprising a central portion of substantially the same height and width as the container, channel formations at the sides and the bottom of said central portion receiving the ends of the side and bottom walls, respectively, and a hollow stiffening and reinforcing formation across the top of said central portion, said hollow formation comprising side, top and bottom walls, and end closures constituted by tongue formations at the ends of the top wall, said tongue formations being bent downwardly into overlapping relation to the side channel formations and being secured against said side channel formations.

4. A container comprising side and bottom walls, and one-piece sheet metal end closures, each end closure comprising a central portion of substantially the same height and width as the container, channel formations at the sides and the bottom of said central portion receiving the ends of the side and bottom walls, respectively, and a hollow stiffening and reinforcing formation across the top of said central portion, said hollow formation comprising side, top and bottom walls, and tongues formed as extensions of the ends of the bottom wall of said hollow formation bent downwardly into overlapping relation to the inner faces of the side channel formations and secured against the latter formations.

5. A container comprising side and end walls, and one-piece sheet metal end closures, each end closure comprising a central portion of substantially the same height and width as the con-

5 tainer, outwardly directed inwardly opening
 channel formations at the sides and the bottom
 of said central portion receiving the ends of said
 side and bottom walls, respectively, tongues at
 the ends of the bottom channel formation bent
 10 into overlapping relation to the inner and outer
 faces of the side channel formations and secured
 against said side channel formations, a hollow
 stiffening and reinforcing formation across the
 15 top of said central portion, said hollow formation
 being composed of side, top and bottom walls,
 the side walls overlying the upper ends of the
 side channel formations, tongues at the ends of
 the top wall bent downwardly into closing rela-
 20 tion to the ends of the hollow formation and
 into overlapping relation to the side channel
 formations and secured against the latter forma-
 tions, and tongues at the ends of the bottom wall
 of the hollow formation bent downwardly into
 overlapping relation to said side channel forma-
 tions and secured thereto.

25 6. A container comprising side and bottom
 walls, end closures, and a one-piece sheet metal
 partition element, said partition element com-
 prising a central portion, flange formations at
 the sides and bottom of said central portion en-
 gaging the inner faces of the container side and
 bottom walls, respectively, tongues extending from
 the side flanges to the outside of the side walls,
 30 formations carried by said tongues disposed
 against the outer faces of the container side
 walls, and fasteners extending through the last
 mentioned formations and the container side
 walls and the side flanges of the partition ele-
 35 ment.

40 7. A container comprising side and bottom
 walls, end closures, and a one-piece sheet metal
 partition element, said partition element com-
 prising a central portion, flange formations at
 the sides and bottom of said central portion en-
 gaging the inner faces of the container side and
 bottom walls, respectively, a tongue extending
 from the bottom flange to the under side of the
 bottom wall, a formation carried by said tongue
 45 and disposed against the under face of the bottom
 wall, and fasteners extending through the last

mentioned formation, the container bottom wall
 and the bottom flange of the partition element.

80 8. A container comprising side and bottom
 walls, end closures, and a one-piece sheet metal
 partition element, said partition element com-
 prising a central portion, flange formations at
 the sides and bottom of said central portion en-
 gaging the inner faces of the container side and
 bottom walls, respectively, formations constitut-
 85 ing extensions of the side flanges of the partition
 element bent across the corners of the container
 side and bottom walls and across the outer and
 bottom faces of the container side and bottom
 walls, respectively, and fasteners extending
 90 through said formation and the container side
 and bottom walls and the side and bottom flanges,
 respectively, of the partition element.

95 9. A container comprising side and bottom
 walls, end closures, and a one-piece sheet metal
 partition element, said partition element com-
 prising a central portion, flange formations at
 the sides and bottom of said central portion en-
 gaging the inner faces of the container side and
 bottom walls, respectively, and extensions of said
 side and bottom flange formations engaging the
 100 outer faces of the container side walls and the
 under face of the container bottom wall, respec-
 tively.

105 10. A container comprising side and bottom
 walls, end closures, and a one-piece sheet metal
 partition element, said partition element com-
 prising a central portion of substantially the
 same height and width as the container, means
 for fastening the container sides and bottom
 against the sides and the bottom of said parti-
 110 tion element, respectively, and a hollow stiffening
 and reinforcing formation across the top of said
 central portion, said hollow formation compris-
 ing side, top and bottom walls, tongues at the
 ends of said top wall bent downwardly into clos-
 115 ing relation to the ends of said hollow formation,
 and tongues at the ends of the bottom wall of said
 hollow formation bent downwardly and secured
 by the aforesaid means for securing the container
 side walls to the sides of the partition element.
 120

WILLIAM C. NORTH.

50 125
 55 130
 60 135
 65 140
 70 145
 75 150