

July 23, 1935.

J. S. JOHNSON

2,008,762

CONTAINER

Filed June 9, 1934

2 Sheets-Sheet 1

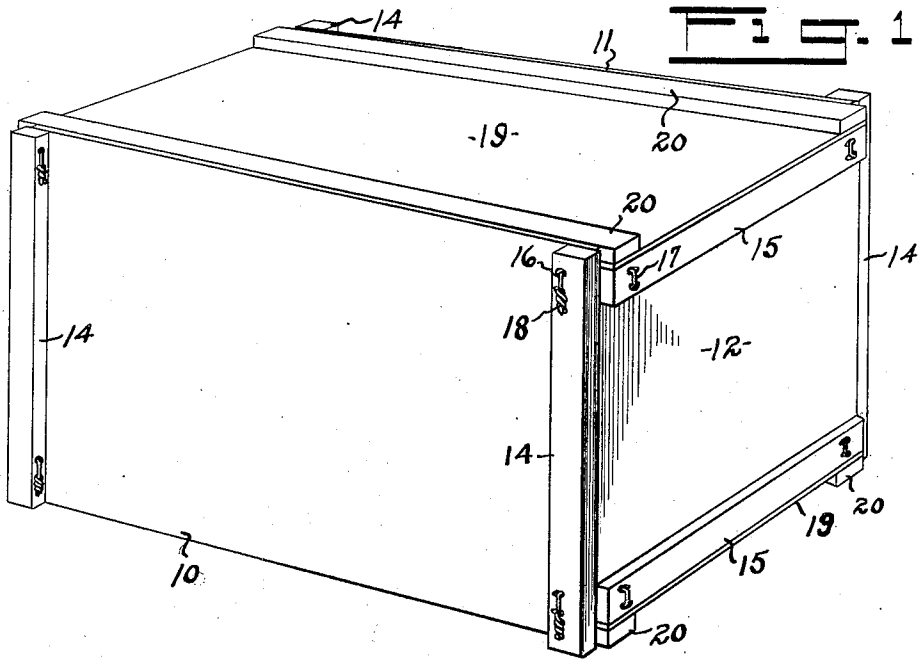
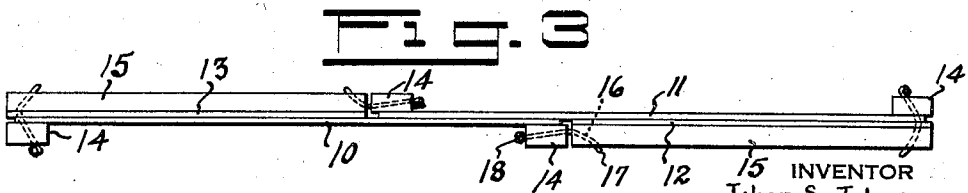
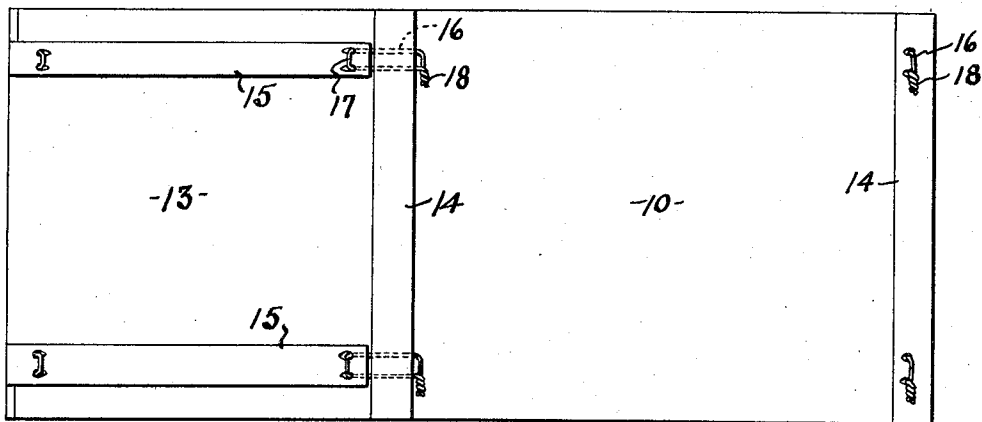


FIG. 2



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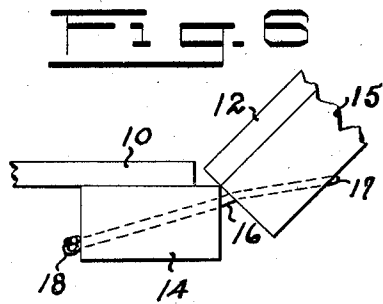
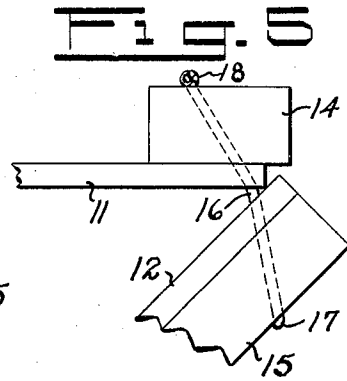
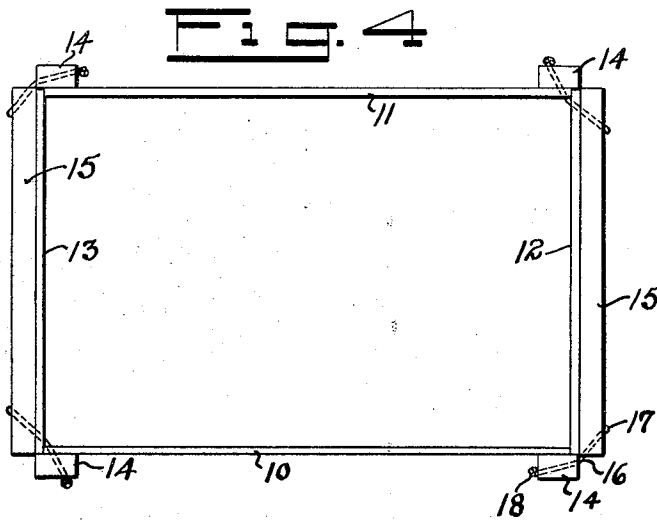
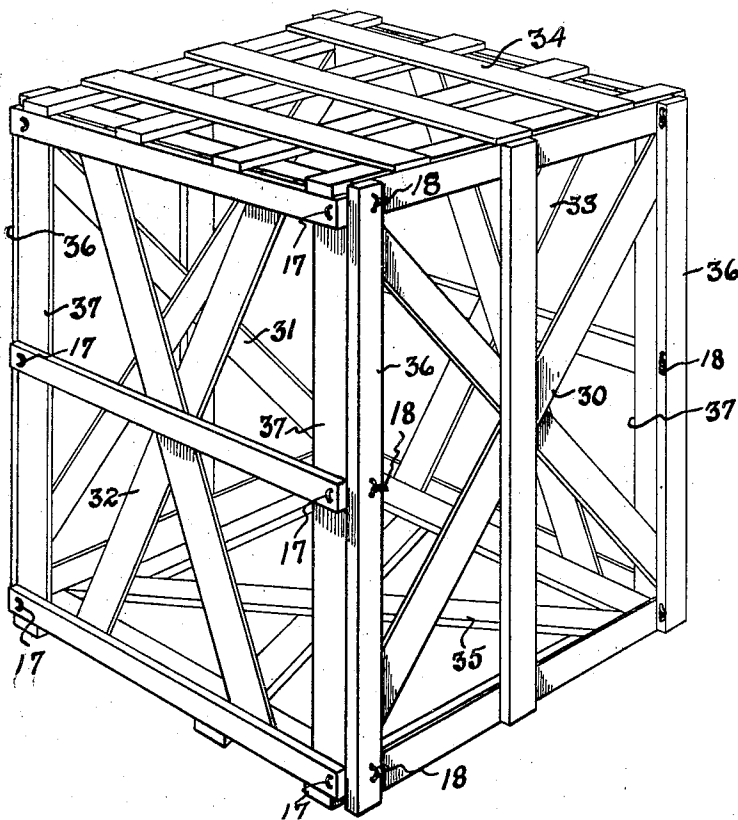


Fig. 7



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UNITED STATES PATENT OFFICE

2,008,762

CONTAINER

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9 Claims. (Cl. 217-12)

This invention is concerned with a collapsible container of the type normally employed for the packaging, storing, and transportation of material.

The main object of this invention is to provide a container construction of such a nature that the parts forming the side walls are all united together in such a manner that they may be folded flat and may be set up by simply opening them and attaching the end walls in place.

More particularly the invention is concerned with a novel form of hinge means for connecting the side walls together so that when they are opened out into container form exceedingly tight strong corners are formed.

These and many other objects as will appear from the following disclosure are secured by means of this invention.

This invention resides substantially in the combination, construction, arrangement and relative location of parts, all as will be described in full detail in the following specification in connection with the attached drawings, and pointed out in the appended claims.

In the drawings,

Fig. 1 is a perspective view of one container in accordance with this invention;

Fig. 2 is a side elevational view of the side walls in collapsed position;

Fig. 3 is a top edge view thereof;

Fig. 4 is a top plan view of the container side walls in open position;

Figs. 5 and 6 are enlarged detail views of the upper and lower right hand corner of the container of Fig. 4 with the parts in partially open position; and

Fig. 7 is a perspective view of a modified form of container or crate in accordance with this invention.

The features of construction comprising the invention herein disclosed have been illustrated in connection with a wooden box, and a wooden container, although it will of course be apparent to those skilled in the art, from the following description, that the nature of the invention is not restricted to the particular materials comprising the structure. The invention as embodied in a box or crate comprises side walls and end walls permanently united together by means of wire hinges or the like so arranged that they may be folded down into parallel relation for ready handling, storage and shipment to the place of use, and may be almost instantly opened out to form a complete container when the top and bottom walls are

so united that they may be folded flat upon each other. The top and bottom walls are applied to the container in such a manner as to increase its lateral or transverse rigidity. The full nature of the invention will best be appreciated from the following detail description and the construction in connection with the drawings.

The container comprises the side walls 10 and 11 which have secured thereto, along opposite ends, the vertical posts or cleats 14. The units 10-14 and 11-14 will be hereinafter referred to as the side wall mats. The end walls 12 and 13 are provided with horizontal posts or cleats 15 at the top and bottom edges thereof. Hereinafter the end walls will be called the end wall mats.

The top and bottom consists of the parts 19 which have the cleats 20 secured along the edges thereof, and will be called the top and bottom mats. The side wall mats and the end wall mats are secured together by means of wires 16 which are looped at their midpoint as indicated at 17 to form a sort of hairpin structure, the legs of which pass through holes in the ends of the cleats 15 and through properly positioned holes in the sides of cleats 14. The legs of the loop are then firmly twisted together, as indicated at 18. The ends are twisted sufficiently so that when the structure is opened up the corners of the container will be very tightly and forcibly pulled together by reason of the tension which is created on the wire hinges.

As is clear from Figs. 3 and 4, the end wall mats 12 and 13 overlies the edges of the side wall mats, thereby imparting to the container considerable transverse strength by reason of the areas of contact of the abutting edges which are held under tension by the wire loops. It will be noted, as indicated in Fig. 3, that the arrangement of the side and end wall mats and the wire loops are such that one pair of diagonally opposite corners fold down to a zero angle while the other pair of diagonally opposite corners fold out into a 180 degree angle when the container is collapsed. This is clear from Fig. 3, and is an important feature of the invention since it is by means of this relative location and connection of the parts that it is possible to provide a container in which the side and end wall mats are permanently secured together. Furthermore, the construction is such that it permits a complete flat folding of the parts and interfitting thereof when the container is opened to provide increased transverse strength.

The length of the wire loops is such that when

the container is opened up they are put under considerable tension, thereby drawing the parts very tightly together. This action will be clear from Figs. 5 and 6 which show the parts being opened up and before they are in fully set up position. It will be clear that as the parts pivot about each other the ends 17 and 18 tend to part a short distance but are prevented from doing so. The result is that the wire loops are put under great tension and the parts are very strongly pulled together, insuring a very rigid container. The top and bottom mats 19 fit down between the side wall mats which are slightly higher, as is clear from Fig. 1, than the end wall mats so as to provide a neat spring container in which the top and bottom mats likewise impart transverse rigidity to the container, and when properly formed hold the side and end walls in rectangular relationship.

As is clear from Fig. 4, it should be noted that the end wall mats 12 and 13 not only abut against the edges of the side wall mats but likewise against the projecting or overhanging edges of the cleats 14. In other words the cleats 14 are secured to the side wall mats so as to provide L-shaped grooves at the ends. It will of course be apparent that a similar result can be secured where the material of the side walls is of sufficient thickness to merely groove or rabbet the ends of the side walls to give a similar result. It is likewise applied where the thickness of the material permits that the cleats 15 may likewise be eliminated.

The features of this invention are shown applied to an open lattice work crate in Fig. 7, comprising the side wall mats 32 and 33 and the end wall mats 30 and 31 which are built up of outside frame pieces interconnected with variously positioned slats or braces to strengthen them diagonally as well as transversely and longitudinally. The side frame members 37 of the side wall mats cooperate with the side frame members 36 of the end wall mats to provide the corner posts which abut against each other under the tension of the wire loops, as previously described. The parts are associated in a manner similar to that of the other construction so that they may be folded flat and quickly opened. The top and bottom mats 34 and 35 likewise nest with the ends to impart transverse strength to the container. The construction of Fig. 7 illustrates that where desired more than two loops may be employed at each corner of the container.

It will of course be apparent to those skilled in the art that the features and principles of this invention may be applied to containers of many forms, and these features may be varied by those skilled in the art without departure from the scope of the invention. For example, the wire hinges may, if desired, consist of a single length of wire rather than the double leg loop as shown. It may likewise consist of more than two lengths if desired.

It is likewise apparent that the features of the invention are in no sense limited to the particular form or type of container employed, as for example a three-sided or a six-sided container may equally employ the features of this invention. I do not therefore desire to be strictly limited to the disclosure as given for purposes of illustration, but rather to the scope of the appended claims.

What I seek to secure by United States Letters Patent is—

1. A collapsible container as described com-

prising a pair of end wall mats and a pair of side wall mats having a diagonal hole at each corner and flexible means in each pair of adjacent holes for securing the end wall mats and side wall mats together, the holes at adjacent corners of the mats lying at other than a right angle to each other whereby when opened into a hollow form, the flexible means is placed under tension.

2. A tight corner crate or box comprising side and end walls arranged together to form a hollow square, the adjacent edges of the side and end walls having holes therethrough extending at an angle to the plane of the walls in which they occur, wire loops locked in said holes and interconnecting said walls, the length of said loops being proportioned so that the walls are opened into a hollow square, the loops are placed under tension and the portions of the loops in the holes lying at other than right angles to each other.

3. A tight corner hinge crate or box of the type described, comprising wall members positionable to abut against each other at adjacent edges when at right angles to each other, said wall members having sets of adjacent holes and wire loops in said holes of such a length that when the wall members are moved into right angular positions with respect to each other, they fulcrum one on the other and place the loops under tension.

4. A tight corner container of the type described comprising a pair of wall members having cleats along the ends thereof to form rabbets, another pair of wall members lying at their ends in said rabbets, said wall members having holes therethrough at an angle to the respective planes thereof, arranged in adjacent pairs and wire connecting members lying in said holes and of such length that when the wall members are disposed at right angles to each other, the wire connecting members tightly seat the second wall members in the rabbets of the first wall members.

5. A collapsible container body, comprising side and end walls arranged in abutting relation to form a hollow square, said walls having holes therein arranged to occur in pairs at the corners of the hollow square and wire members locked in said holes of such a length that when the wall members are formed up into a hollow square, the wire members tightly draw the wall members into contact at the angles.

6. A container body as described having side walls, cleats secured along opposite edges of the side walls, end walls having cleats secured along the top and bottom edges thereof, said members being positionable into a hollow square with abutting edges, said cleats having holes therein, occurring in pairs on adjacent walls and wire loops lying in said holes of such length that when the walls are in rectangular relationship, the loops are under tension and the portions in adjacent holes lying at an obtuse angle to each other.

7. The combination as described comprising side wall members having a rabbet at opposite ends, end wall members abutting against the side wall members in said rabbets, all of said wall members having holes near the abutting edges thereof extending at an angle to the respective planes thereof and wire loops locked in said holes of such length that they are placed under great tension when the wall members are formed into a hollow square.

8. A collapsible tight corner container of the type described comprising a pair of end wall mats

5 and a pair of side wall mats each having a pair of holes extending therethrough adjacent each corner, and a closed wire loop passing through adjacent pairs of holes, one at each corner for hingedly securing the mats together, the length of the loops being less than the distance between the hole terminals when the container is opened up whereby the loops are placed under tension.

10 9. A tight corner container of the type described comprising a pair of end wall mats and a pair of side wall mats each having a pair of holes

extending therethrough adjacent each corner, wire loop passing through the adjacent pairs of holes one at each corner for hingedly securing the mats together, both legs of the loop lying in said holes, the length of said loops being less than the distance between the points where they enter the holes when the mats are formed into a hollow square so that they are pulled together under great pressure. 5

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