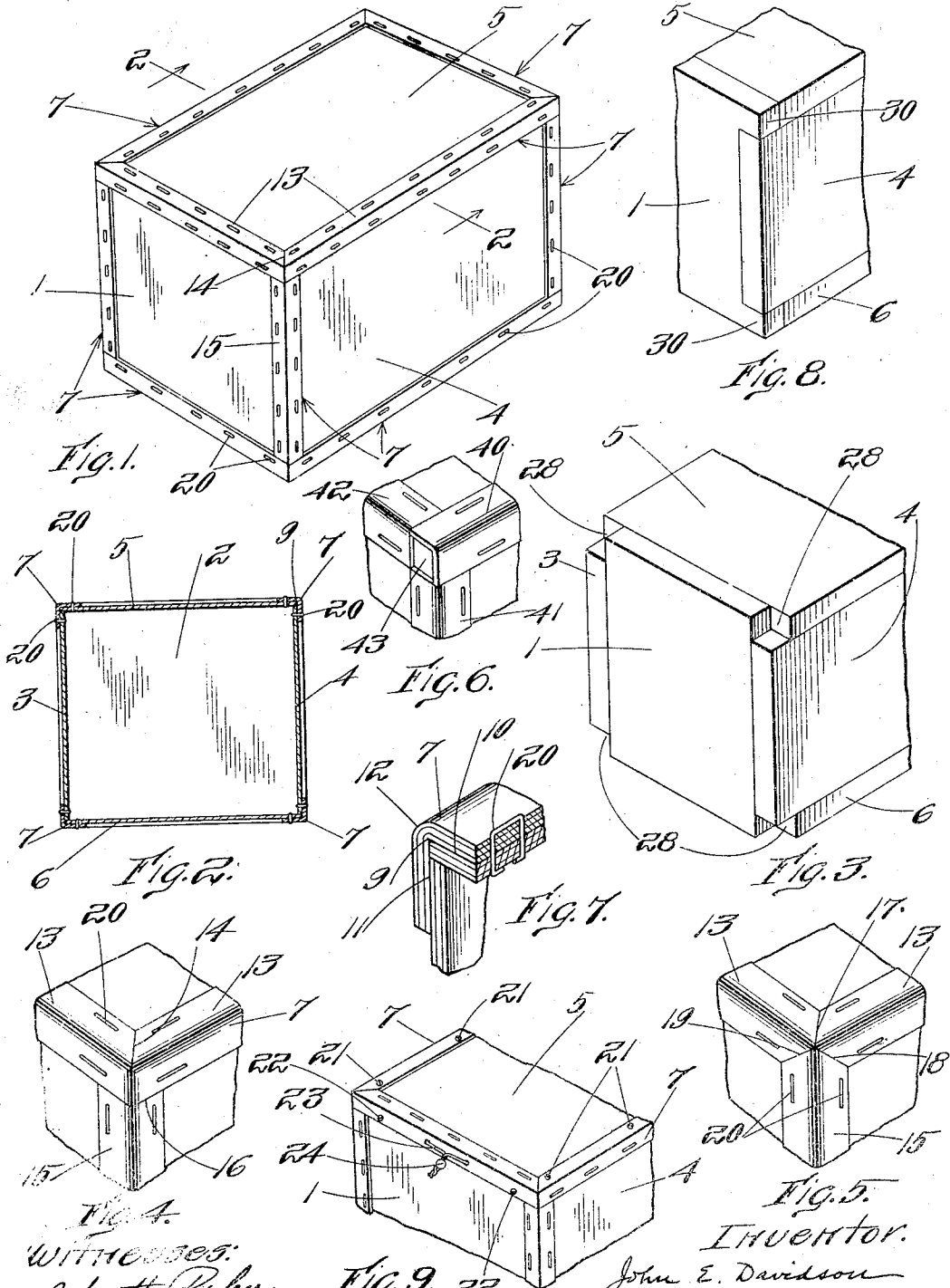


J. E. DAVIDSON.
 BOX.
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Patented Mar. 10, 1914.

1,089,538.



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FIG. 9.

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BOX.

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To all whom it may concern:

Be it known that I, JOHN E. DAVIDSON, a citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Boxes, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has for its object an improved shipping case or box, more especially designed for use in the shipment of articles of merchandise and the like, but which may also be advantageously employed as a box or container for all purposes for which light, strong and durable boxes are required.

The invention is fully set forth in the following description, taken in connection with the accompanying drawing, and the novel features thereof are pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a perspective view of a box embodying my invention. Fig. 2 is a section on line 2—2 Fig. 1. Fig. 3 is a perspective showing the preferred relation of the ends, sides, top and bottom to each other. Fig. 4 is a perspective of a box corner showing one way in which the edge binding strips are joined at the corner. Fig. 5 is a similar view showing another way in which said edge binding strips are joined at a box corner. Fig. 6 is also a perspective of a box corner showing still another way in which the edge binding strips may be joined. Fig. 7 is a detail of the device for fastening the corner binding strip in place and showing the laminated construction of the material of the box. Fig. 8 is a detail view showing overlapping wall parts of a box and of such construction as to fill in the recesses at the corners of the overlapping parts. Fig. 9 is a view partly broken away of a box provided with a slidable cover and seal therefor.

Shipping cases or boxes as now commonly constructed are made from sawed lumber, and in all the usual sizes when made strong enough to insure safety in transit are relatively heavy and require a relatively large amount of lumber. The weight increases the transportation charges, and the large quantity of lumber used increases the expense and results in a very considerable waste of a material which is day by day becoming

less abundant. This waste is very largely increased owing to the fact that generally shipping cases made from sawed lumber are used but once and are then either destroyed or put to less important uses.

A shipping case embodying my invention is light, strong and relatively inexpensive. It may be opened without destroying any portion of it, and may therefore be used repeatedly, and it is tight enough as ordinarily constructed to carry, without loss, fine-grained merchandise such for example as flour, small seeds, and the like. It may also be secured by a seal, so that it cannot be opened without breaking the box or destroying the seal, and this further insures delivery of the goods to the consignee safely and without loss.

My improved case will be readily understood from the following description of the construction of the same. The ends 1 and 2, the sides 3 and 4, and the top and bottom 5 and 6 are formed from laminated wood, see Fig. 7. This wood consists of two or more, preferably, three sheets of laminae which may be readily formed by the use of a veneer machine of well known construction from properly tempered bolts or logs. A moist sheet, as it comes from the log, is placed on a table and coated with a rather heavy coating of cement. The next sheet is then laid on top of the first one, preferably with the grain of the wood in crossed relation to the grain of the first sheet. This second sheet is also coated with cement, and a third sheet is then placed on top of the second sheet. The moist sheets which are thus built up are then subjected to pressure and heat in a hot press of any well known construction. This causes the cement to permeate the wood securing the sheets firmly together and the whole is dried by the heat under pressure, forming a comparatively thin but very strong and tough sheet of material.

The number of plies or sheets of wood used may, as will be obvious, be increased if greater strength is desired, and the thickness of the sheets used may also be varied in accordance with the result desired. The sheets thus produced are then cut in any well known manner to the desired shape and size required for the ends, sides, top and bottom of the box. They are then put together in

the relation to each other shown in Fig. 3, in which the sides 3 and 4 rest on the bottom 6 along the side edges thereof. The ends 1 and 2 overlap the top and bottom 5 and 6 and fit between and are overlapped by the side portions 3 and 4. The top 5 and bottom 6 overlap the sides and abut against and are overlapped by the ends 1 and 2. This relation of the parts is shown clearly in said Fig. 3.

It will thus be understood that the body of the improved box is composed of sides, ends and top and bottom parts of laminated wood, the said parts or walls of the box supporting and preferably overlapping each other at contiguous points, or at the corner parts of the box.

The parts in the relation to each other above specified are secured together by means of molded strips of corner-binding and reinforcing material 7. This corner binding is preferably substantially the same throughout and is applied to all the edges or corners of the box, as shown. The corner binding is also made from laminated wood built up in substantially the same way as is the material for the ends, sides, top and bottom of the box. In its moist condition, however, after the plies or sheets have been laid together with the intervening layers of cement, it is cut into strips of the proper width and these, while still moist, are subjected to heat and pressure in a molding machine, provided with cooperating forms, or molds, the interior operative surface of the one form corresponding in shape with the exterior shape desired in the corner binding, and the operative surface of the other form corresponding in shape with the interior shape desired in the corner binding. The corner binding will ordinarily have a convex external shape and a right angular interior shape in cross section as shown, since the boxes ordinarily made have what are termed square corners, but the shape might be varied as desired.

The interior angle of the corner binding should be sharp, that is, come to a substantially sharp point in cross-section, as shown at 9 Figs. 2 and 7, so that the interior surfaces 10 and 11 of the binding may lie closely in contact with the adjacent sides of the box throughout the whole of said interior surfaces. The exterior surface of the binding is rounded, at the corner, as shown at 12, which gives a much stronger construction and is for various reasons which are obvious more desirable than a sharp exterior corner would be. The width and thickness of the binding may be varied as desired as will be clear.

The corner binding should for the best results be applied so as to cover the edges or corners of the box throughout, as shown. One convenient way of doing this is shown

in Fig. 4 in which the corner binding 13 which extends around the top edges of the box is mitered at the corner as shown at 14. The vertical strip of corner binding 15 which overlaps the adjacent sides and ends of the box at the corner is at its upper and lower ends butted against the top and bottom corner binding, as shown at 16. If desired the binding 13 around the top of the box and the vertical binding 15 at the corner of the box may (see Fig. 5) be mitered where they abut, as indicated by the lines 17, 18 and 19 in said figure. Either of these styles of corner construction make a neat, strong and satisfactory corner. A less expensive form of corner is shown in Fig. 6 in which no mitering is employed. One edge binding 40 is extended to the corner and the adjoining edge bindings 41 and 42 are abutted against it. This leaves a small open space at 43 which is not covered by the binding. This space interferes somewhat with the finish and appearance of the box, but for many uses a box so constructed is practically as good as one having the corners mitered.

The corner binding is secured to the adjacent sides or outer walls of the box (the word "sides" is here used to denote not only the sides proper but the outer walls comprising the bottom, top and ends as well) preferably by means of metallic staples 20, which may be inserted very rapidly and perfectly by means of a stapling machine of well known construction. These staples are turned and clenched on their inner ends and form a very secure fastening. Nails which are driven and clenched may be employed but I prefer the staples since they are superior as securing means, in my opinion and may be much more readily applied. This corner binding and reinforcing material is relatively light, very strong and durable and not liable to crack or split.

In the description thus far given I have contemplated forming both ends of the box alike, that is, the end portions, one of which is shown at 1, Fig. 3 both project up to a point which is flush with the upper surface of the top or cover 5. For the purpose of producing a box which is capable of being repeatedly used, I prefer to form the top or cover so that it may be slid on or off, and to do this one of the end pieces, such as are indicated at 1, Fig. 3 is made of less width from top to bottom than the other so that its upper edge instead of being flush with the upper surface of the top or cover 5 is substantially flush with the under surface thereof or with the upper edges of the sides 3 and 4. This permits the cover to be slid onto the box or withdrawn therefrom. When the cover is to be withdrawn the corner binding at the front end of the cover is permanently secured to the cover by means of the staples

heretofore described, or other well known securing devices, and the corner binding around the top of the box, along the sides and at the other end, is permanently secured to the sides and end respectively. The cover may then be slid under the corner bindings and along the top of the sides. After it has been slid into place it may be firmly secured, preferably by means of a series of screws 21 which pass through the overlapping corner binding into the edges of the cover, or in other well known manner. These screws may likewise be used at 22 at the front end of the cover, although it will be found generally, that they are not necessary at this point, and especially is this the case if the box is not to be sealed. In the latter case the sealing may be readily and positively effected by passing a wire 23 through the top edge of the end and through the downwardly projecting flange of the corner binding at the front end of the cover, the ends of this wire are then twisted upon themselves and fastened by a lead seal 24 in the usual manner. To open the box it is only necessary to remove the screws 21 and 22 and break the seal 24. The cover may then be withdrawn.

My construction insures a very durable and strong case of light weight, entirely free from cracks or openings and which may be put to a large variety of uses. Boxes constructed in this manner will carry a greater weight of material than boxes of the same size made from sawed lumber, and are much lighter and more economical in use and are capable of repeated use.

It will further be noted that in a box or case the ends, sides, top and bottom, of which are placed in the relation to each other heretofore described, are so located that a direct pressure tending to force the ends, sides, top and bottom inwardly is borne by the adjacent parts so that the fastenings which secure the parts to the strips of corner binding and reinforcing material are subjected in such case to only a minimum of strain. They are relieved substantially from all direct strain and serve chiefly to resist any strain which tends to laterally displace said ends, sides, top or bottom.

It will further be noted that in the construction shown Fig. 3 which shows the parts, that is the ends, sides, top and bottom of the box much enlarged, there is a recess at each corner of the box, shown at 28. This may be filled in, if desired, by forming the ends of the box as shown Fig. 8, that is with projections 30 which will fill in said spaces at the corners. I have not found it necessary to so shape the ends as to fill these spaces or recesses at the corners because the material from which the parts of the box, that is the sides, ends, top and bottom are formed is relatively very

thin and the space which is shown in exaggerated form in said Fig. 3, for greater clearness, is so small as to be negligible in the construction of a box or shipping case for all ordinary uses. The strong and thoroughly secured corner binding and reinforcing strips entirely cover and protect these corners so that I have not found it necessary to so construct the ends as to fill the slight spaces which are left by the construction shown in Fig. 3.

What I claim is;

1. The improved packing box consisting throughout of laminated wood comprising laminae built up with the grain of the layers in crossed relation and united and permeated by cement, said box comprising contacting top, bottom, ends and sides supporting each other at the corners of the box, rigid corner reinforcing strips overlapping the contacting walls of the box and each having a sharp internal angle, the inner overlapping faces of said strips being in contact throughout their lengths with the adjacent walls of the box, and means for securing said reinforcing strips in place.

2. The improved packing box comprising overlapping top, bottom, sides and ends forming the walls of the box and composed of laminated wood, consisting of laminae secured together and permeated by cement, combined with rigid corner binding strips overlapping said walls and having a sharp internal angle, said corner binding strips being composed of laminae of wood secured together and permeated by cement, and means for securing said corner binding strips over said contiguous walls to cause the inner surfaces of said strips to lie in contact throughout with the adjacent walls of the box and firmly secure and clamp them together.

3. The improved laminated wood box, consisting of top, bottom, sides, and ends, forming the walls of the box and having their edges in contact with and supporting each other, said wall parts being composed of laminae of wood with the grain placed in crossed relation and united and permeated by cement, combined with rigid corner bindings composed of laminae of wood with the grain placed in crossed relation and united and permeated by cement, said corner bindings overlapping the walls of the box and each having a sharp internal angle and mitered ends, and means for securing said corner bindings to the walls of the box with their mitered ends in close engagement and their internal faces in contact throughout with the adjacent box surfaces.

4. The improved packing case having overlapping top, bottom, ends and sides, forming the walls of the box, of laminated wood united and permeated by cement, the overlapping parts forming the walls of the box supporting each against pressure from

without, combined with rigid corner bindings around the box edges and composed of laminæ of wood united and permeated by cement and each having a sharp internal angle to permit their internal faces to lie in contact throughout with the surfaces of adjacent wall parts, and means for securing said corner bindings to said box edges to strengthen and support the box.

10 5. The improved packing case, composed of laminated wood united and permeated by cement, having sides, ends and top and bottom parts, a portion of each of said parts overlapping the edge of an adjacent part,

15 combined with rigid corner bindings com-

posed of laminæ of wood united and permeated by cement and each having a sharp internal angle, said top part having a corner binding strip secured along one edge, and means for securing said first mentioned corner bindings to the box edges to cause said corner bindings to lie in contact throughout with the adjacent box surfaces.

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

JOHN E. DAVIDSON.

Witnesses:

WILLIAM A. MACLEOD,
ALICE H. MORRISON.

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