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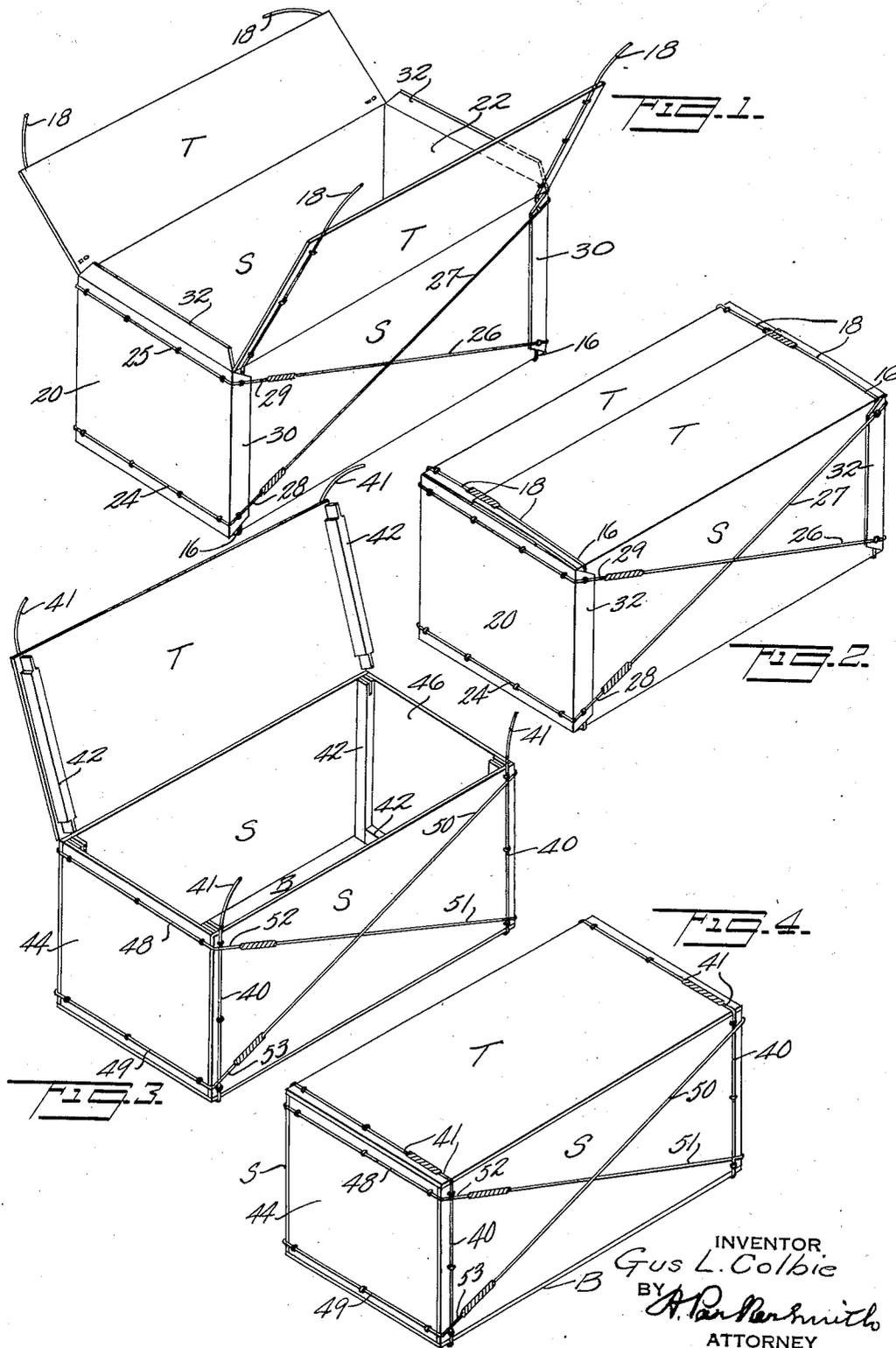
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2,022,538

WIREBOUND BOX

Filed April 23, 1932

4 Sheets-Sheet 1



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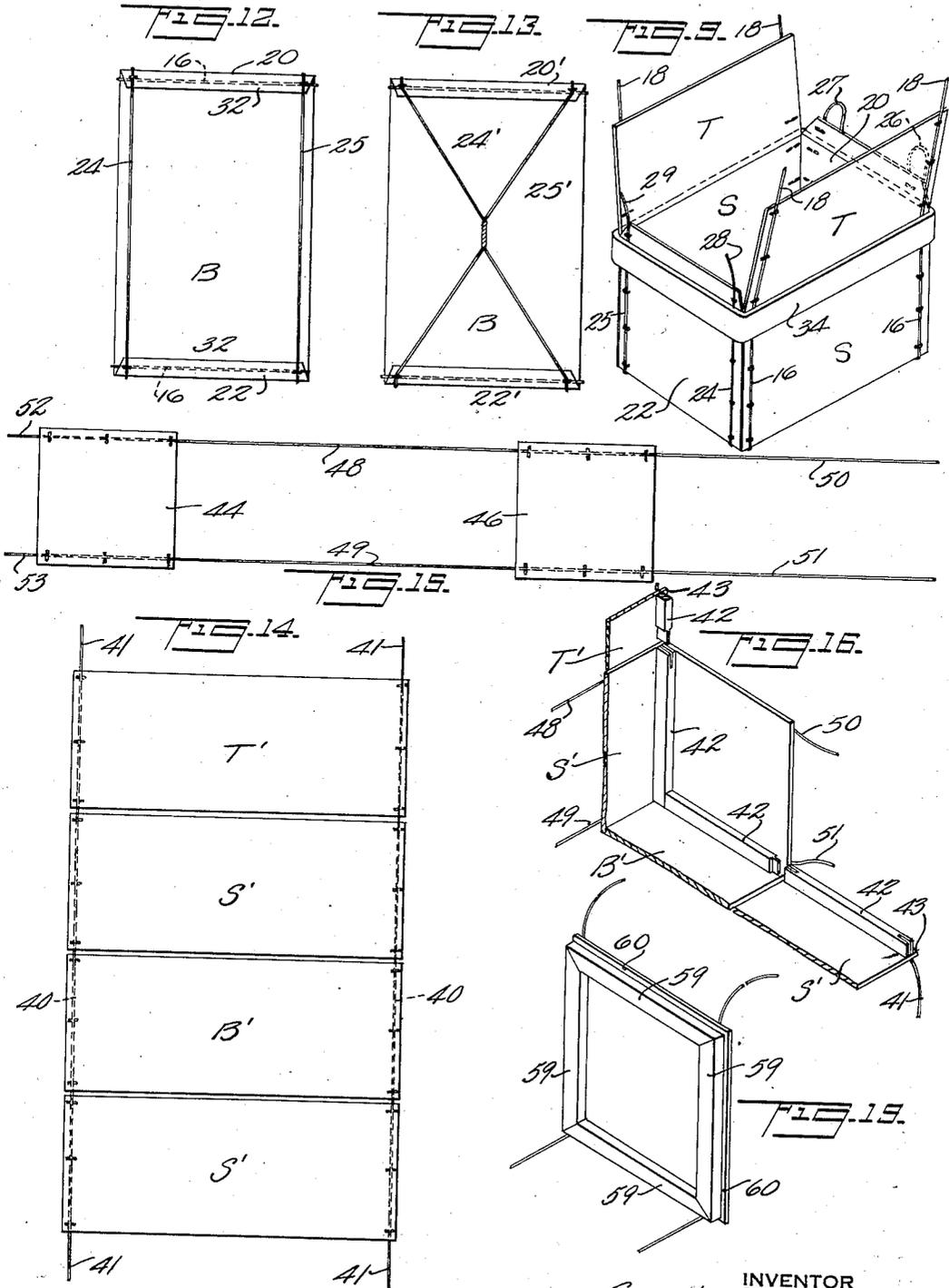
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WIREBOUND BOX

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4 Sheets-Sheet 3



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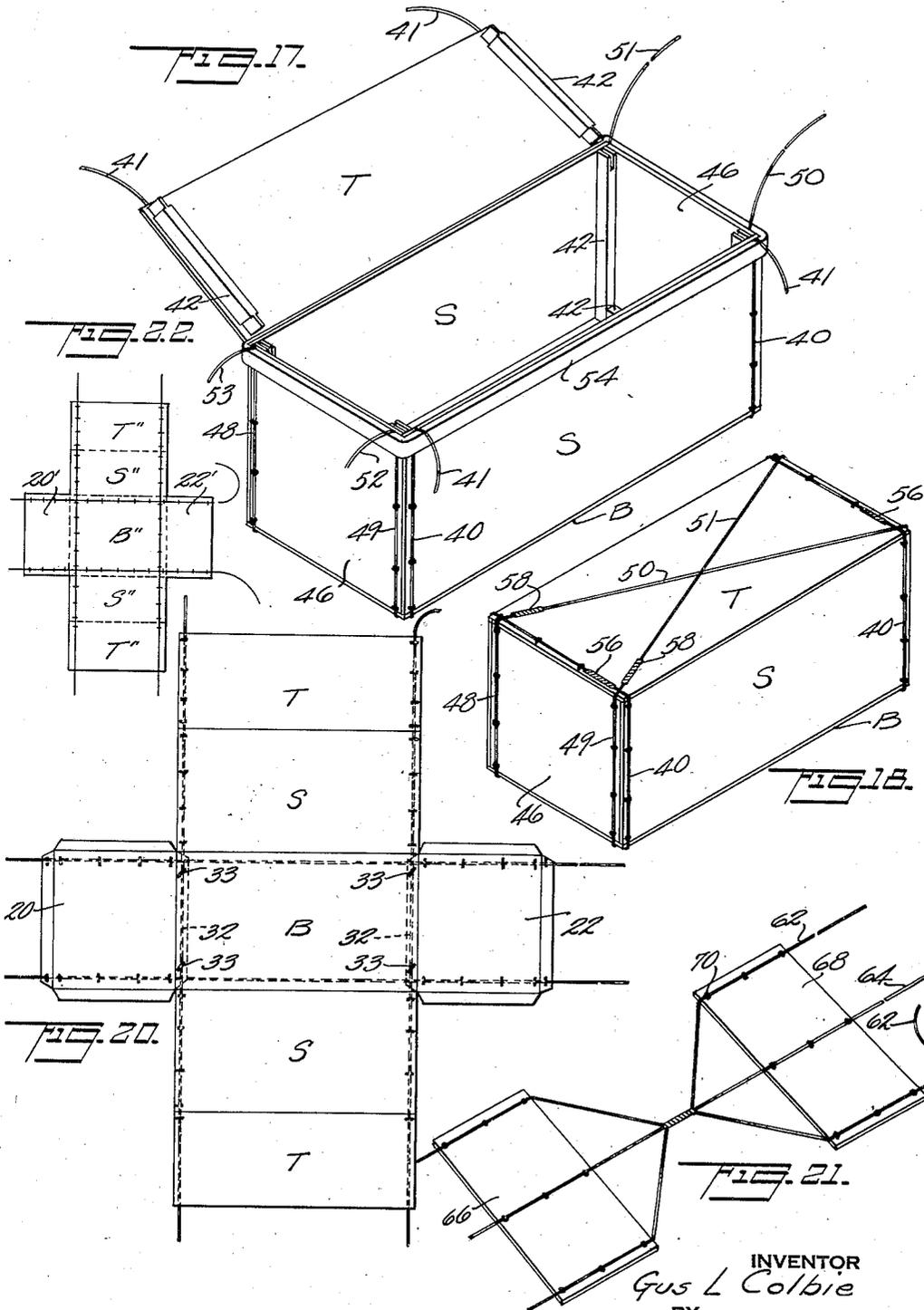
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WIREBOUND BOX

Filed April 28, 1932

4 Sheets-Sheet 4



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WIREBOUND BOX

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16 Claims. (Cl. 217-12)

My invention relates generally to wire bound boxes and more particularly to box blanks having binding wire secured thereto, which are adapted to be folded or assembled so as to have the binding wires surrounding the completed box, and preferably running crosswise or in transverse relation one to another at certain points.

In the box making art, the common forms of boxes include the paper box, the nailed wooden box, the wire bound wood box, and the fibre or composition boxes. The paper and fibre boxes are used principally for light packing, while the wirebound wood boxes are used for heavy packing.

According to the present practice, the blanks forming the top, bottom and sides for wire bound boxes are constructed by joining a plurality of separate panels together with binding wire, then folding upward said panels on said wires as hinges to form the sides of the box, the last panel forming the top. End members are then inserted in the open ended structures so formed and nailed to the side panels, and the box is packed. After packing, the top panel is folded down and the ends of the binding wires on the side panels are spliced together over it.

In accordance with my invention, both the side panels and end panels are flexibly joined together by having binding wires attached thereto, i. e., two blanks are formed, a side, bottom and top forming blank and an end blank or blanks which are adapted to be assembled into a box, packed and sealed without resorting to any finishing operations other than splicing the ends of the binding wires together.

This improved box structure is adapted for use with wood, fibre or any composition material, and when completely assembled, the preferred form has the binding wires running crosswise, to provide a securely bound structure.

The principal object of my invention is to construct wire bound boxes of wood, fibre or like material, by utilizing a two blank structure, each blank having binding wires attached thereto and serving, partly or wholly, to hold its different portions together, said blanks being adapted to be readily formed into a box structure which can be packed and sealed without resorting to any end fitting, nailing or stapling operations.

Another object is to provide a bracing means for retaining the sides and ends of the box in a vertically assembled relation while said box is being packed.

Another object is to provide a wire binding on each of the box blanks, which bindings will preferably cross each other in a transverse or diagonal relation when the blanks are assembled.

By my arrangement, I usually provide two blanks, one comprising a plurality of flexibly connected panels having binding wires secured thereto, to form the bottom, top and side walls of a box, and another comprising two panels spaced a predetermined distance apart, also having binding wires attached thereto, to join same together properly spaced apart to form the end walls of a box when assembled with the first blank. Such a box is formed for packing by either of the following preferred methods: by placing the bottom panel of the side wall blank over the intervening exposed portions of the wires joining the end wall panels, then folding the end walls and two side walls vertically upward and retaining same in said latter position by means of a hoop or other suitable means; or by placing a side panel of the side wall blank against the intervening exposed portions of the wires joining the end wall panels, then folding the end walls in place by swinging them like doors and joining the ends of the binding wire carried by said end wall panels over the other side wall. After packing, the projecting portions of the body panels, forming the top (if it is a fibre box), are closed, and the wire ends projecting therefrom are twisted or spliced together. No extra nailing or stapling operations are required at the packers, all finishing operations being completed by a wire twisting tool, used to splice the free ends of the binding wires together. A box may be constructed, however, within the broad principle of my invention if made from a single blank properly wired, as will be hereinafter explained.

Several embodiments of my invention are illustrated in the following drawings, in which,

Fig. 1 is a perspective view of a wirebound fibre box provided with crossed binding wires, in which the binding wires which are attached to the end blanks are used to support the box in assembled form ready for packing.

Fig. 2 is a perspective view of the box shown in Fig. 1, with the top closed and all the binding wires spliced together after packing.

Fig. 3 is a perspective view of a wirebound box in which wood or fibre panels are used with cleats attached to the body panels and all the parts assembled for packing in the same manner as the box shown in Fig. 1, except that the top is bound by one flap only.

Fig. 4 is a perspective view of the box shown in Fig. 3, with the top closed and all the binding wires spliced together after packing.

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Fig. 5 is a plan view of a blank for forming top, bottom and side walls, having binding wires attached thereto and particularly adapted for fibre or like box structures.

5 Fig. 6 is a plan view of one form of end wall blank composed of two panels wired together and used in combination with the blank shown in Fig. 5 to form a complete box.

10 Fig. 7 is a perspective view of the end wall blank of Fig. 6 with the side tabs bent up into position for the assembly with the other blank.

Fig. 8 is a perspective view showing a method of assembling the box blanks shown in Figs. 5, 6 and 7, when the binding wires of the end blank are to pass around the top and bottom of the box when assembled.

15 Fig. 9 (sheet 3) is a perspective view showing an assembled box employing the blanks shown in Figs. 5 to 8 ready for packing, using the arrangement shown in Fig. 8, all the free ends of the wires being here shown exposed, and the sides temporarily held together by a hoop.

20 Fig. 10 is a perspective view showing the box illustrated in Fig. 9 after it has been packed, and closed and the binding wire ends have been spliced together.

Fig. 11 is an enlarged fragmentary perspective view of a portion of the packed box shown in Fig. 10, with parts broken away.

30 Fig. 12 is a bottom plan view of the completed box illustrated in Fig. 10 showing a parallel arrangement of the binding wires along said bottom.

Fig. 13 is a view similar to Fig. 12 showing a diagonal arrangement of such binding wires.

35 Fig. 14 is a plan view of a blank for forming the box bottom, sides and top similar to Fig. 5, but which is composed of individual panels bound together by the binding wires, instead of being formed from an integral sheet wired to permit bending.

Fig. 15 is a plan view of the end wall blank, which is used in conjunction with the blank shown in Fig. 14.

45 Fig. 16 is a fragmentary perspective view showing cleats attached to side, bottom and top panels of the type of blank illustrated in Fig. 14, and one method of assembling the box.

50 Fig. 17 (sheet 4) is a perspective view showing an assembled, cleated box of the type partly illustrated in Fig. 16, ready for packing, the sides and ends being temporarily maintained in assembled relation by a hoop.

Fig. 18 is a perspective view showing the box illustrated in Fig. 17 after it has been packed and closed and all binding wire ends have been spliced together.

Fig. 19 (sheet 3) is a perspective detail showing cleats attached to an end panel, instead of to the side, top and bottom panels, as in Fig. 16.

Fig. 20 shows a modified form in which the end panels have been attached to the bottom panel of the other blank by staples in the first stage of the assembling operation.

65 Fig. 21 is a perspective view of a modified form of end blank in which more than two wires are shown as binding wires for the end panels, one of which wires is shorter than the other two, to permit said others to be drawn together at the center in diagonal relation, as shown, and

70 Fig. 22 shows still another modification in which one integral blank is used, being scored along the lines between adjacent panels.

75 In the drawings like reference characters indicate like parts.

It may be observed that one dominating feature appears in all the above illustrated modifications of my invention, i. e., that in no case is a set of parallel binding wires employed which are spaced apart by an overall distance in excess of the maximum dimension of the completed box, thus rendering it possible to apply all the necessary binding wires to the blank or blanks in a staple setting machine of only the normal standard width now in use.

10 Referring to Figs. 5 to 13, the box parts or blanks shown therein are particularly designed for fibre box construction or any manufactured composition, such as paper, card board material or the like. The said box structure shown in these figures of drawings comprises two blanks, one, generally indicated by the reference character 10, forming the side walls, top and bottom, and another similarly indicated by 12 for the end panels, which together are adapted to be formed into a box structure of the types shown in Figs. 1 and 9, ready for packing and closing.

Each blank 10 is composed of a single sheet of material which is scored along lines indicated at 14 to provide a plurality of panels marked S, B and T, said panels forming the sides, bottom and top of the box respectively. Binding wires 16 are secured to one surface of the blank 10, by means of staples 70, as shown in Fig. 5, or in any other convenient way, with the ends 18 of said wires projecting beyond the edges of the blank.

25 The end blank (Fig. 6) comprises two panels 20-22, which are joined together in spaced relation by means of two or more binding wires 24-25, said wires being similarly secured to the surface of each panel by stapling or otherwise, as indicated in Figs. 6 and 7, and having their ends 26-28 and 27-29 projecting beyond the ends of the blank so formed. It will be noted that the wire ends 26-27 are preferably made longer than those of the wires 28-29, for a purpose to be hereinafter described. Side tabs 30, 30, and upper and lower tabs 32, 32 are added on these end panels to reinforce the box structure at the corners and may be made in any desired shape, the adjacent edges of tabs and panel bodies being outlined by scoring as shown.

Both blanks 10 and 12 are easily constructed by passing the panels in assembled relation through automatic box making machines. These machines apply the binding wires, staple the same to the panels, and cut said binding wires to the desired lengths as each blank is carried through. After the blanks are thus completed, they are adapted to be stacked in pairs, each comprising one end blank and one side, bottom and top blank, one above the other, for shipping, thus occupying only the floor space necessary for the larger one of the two blanks.

At the packing plant, the blanks are easily and quickly formed into boxes ready for immediate packing, closing and sealing.

60 According to one method of assembly, the end blank is first placed in the position shown in Fig. 7, then the panels S, B and T of the other blank are folded and placed over the wire portions 24-25 intermediate of the two panels 20-22 of the end blank as shown in Fig. 8. Next the end panels 20-22 are bent upward into vertical position with the side tabs 30 preferably passing inside of the side panels S, and the upper tabs passing outside of the top panels T, the lower tab being already located under the bottom panel B by the initial act of assembly. To retain the walls in this folded, box forming relation prior

to packing, a hoop 34 or the like embracing element is slipped over the box, to hold the sides and ends together, in assembled position while the box is being packed, all as shown in Fig. 9.

5 After packing, the top panels T are folded together downward and the opposite ends 18—18 of each wire 16 are spliced together as indicated at 56 in Fig. 11; then the end projections 26—27 of wires 24—25 are drawn diagonally across the top of the box and joined to ends 28—29 by splicing the end 26 to the end 29, and the end 27 to the end 28, as shown at 58 in Figs. 10 and 11.

10 Another and perhaps preferred and simpler method of assembly is shown in Figs. 1 and 2, in which the end blank is assembled with the side walls in such manner as to have the binding wires on the end panels pass around the side walls S, S of the box and thereby brace the sides as well as the ends in their assembled relation for packing, thus dispensing with the hoop 34.

20 It is obvious that, by means of the binding methods described, a stronger box can be made from the less expensive grades of fibre or paper stock, since the wire binding reinforces nearly all the corner edges of the box, and the diagonal wires provide additional bracing against lateral distortion, which is more effective than any produced by merely running the wires 24—25 parallel across the bottom of the box, as shown in Fig. 12.

30 Diagonal bracing wires may also be provided at the bottom as shown in Fig. 13, by extending the length of the wires 24'—25' between the end panels 20'—22', to provide the necessary amount of slack to permit said wires to be drawn toward each other at the center, and twisted together.

35 This latter operation is preferably performed when the binding wires are attached, by means of a twisting member on the box blank machine. With both the upper and lower diagonal bracing, the box will be strong enough to easily withstand the rough handling to which packed boxes of this character are usually subjected.

40 It may be desirable to permanently secure the panels of the end blank 10 to the other blank 12 before forming the box at the packers, and for this purpose I propose to secure each of the end panels 20—22, to the bottom panel B of the blank 12, by stapling the inner tabs 32 projecting from said end panels 20—22, at 33 to the bottom panel B, as shown in Fig. 20, or in any other convenient way.

45 If economy of space when packing the blanks for shipment to users, and if material consumed in making the blanks are not controlling factors, a firmly knit, easily assembled box may be produced from a single, integral blank 100, as shown in Fig. 22, where the end panels 20' and 22' project from the sides of the body blank which is composed of the side, bottom and top panels S'', B'' and T'', as before, the single sheet of fibre material being scored to form the lines of bending. Tabs or cleats (not shown) would be used as in the other modifications. The various panels would be bent up and over to form the completed box as before, after the binding wires had been fastened to them in proper position as previously described, the ends of all wires being spliced together, and some of them crossed as before. Such a blank would be passed twice through the same stapling machine or machines as are used for fastening the wires to the previously described blanks.

70 The two blank crossed wire method of construction may also be applied to box assemblies composed of other forms of blanks, such as are

now used in wire bound boxes, crates and the like, said crossed wire arrangement involving an improved method over the present practice in wire bound box constructions.

According to the present practice of constructing wire bound wood boxes, the body blanks are fabricated in about the same manner as the body blanks of my invention, but the end panels are secured to the box by nailing or stapling, which operation is not required, by my method of construction, now to be described.

10 In Figs. 14 and 16, a body blank for a wooden box is shown, which comprises a top, bottom and two sides as indicated by the reference letters, T', B', and S', S', respectively, said panels being flexibly joined together by binding wires 40, which wires are secured to the said panels by stapling. The ends of said wires project beyond the edges of the end panels as indicated at 41. Cleats 42 may be provided for the side panels as indicated in Fig. 16, which cleats are joined thereto in a well known manner, and are preferably placed at a slight distance inward from the ends of the body panels to accommodate the thickness of the end panels, and to provide a ledge 43 projecting beyond the same when assembled, as shown.

While the above panel structure for a body blank has been referred to as made of wood, it is to be understood that fibre or other suitable material may be substituted.

30 The end wall blank shown in Fig. 15 comprises two panels 44, 46, which are joined in spaced relation by having binding wires 48—49 secured thereto, as in the construction of the end wall blank shown in Fig. 6, each wire projecting beyond the outer edges of the panels as indicated at 50, 51, 52 and 53, the ends 50 and 51 preferably being longer than the ends 52—53.

40 The methods of assembling the wooden box are similar to those employed with the fibre box previously described. One of such methods is clearly shown in Fig. 16, which method of assembly is to place the bottom panel B' of the body blank over the portions of the binding wires 48—49, intermediate of the end panels 44—46, (as has been described with reference to the fibre box) then bend the side panels S'—S' and end panels 44—46 upward to form a box, which has its top open, and thereafter place a hoop 54 around the outside of the assembly to temporarily hold the parts in position to form the box structure as shown in Fig. 17, and which is ready to be packed.

55 After packing, the top panel T is moved downward to close the box and the projecting ends of each wire 41, are first spliced together as indicated at 56—56, Fig. 18; then the projecting ends 50—51 of the wires 48—48 are crossed diagonally and spliced to their opposite projecting ends 52—53 as indicated at 58—58, the end 50 being spliced to the end 53, and the end 51 to the end 52.

65 By this arrangement, the box is easily formed, packed and sealed without resorting to the driving of any nails, staples or the like, and the box so produced is stronger than the ordinary wire bound box, due to its diagonally crossed wire binding.

70 As in the previously described fibre box structure, this type of box may also be provided with the diagonal wire binding on its lower surface, and in the same manner as described with reference to said fibre box.

Another method of assembling the blanks and

wires to form a box is illustrated in Figs. 3 and 4, in which the end blank is so placed with reference to the side walls as to have the binding wires on the end blank extend around the side walls, thereby strongly bracing the sides and ends of the completed box to withstand the strain of packing and handling.

In certain cleated box structures such as illustrated in Fig. 16, it will be noted that the side panels project beyond the cleats sufficiently to engage the edges of the end panels, so that when the box is completely formed, the end panels are nested in the recesses bound by the projecting walls of the side, top and bottom panels and there nest snugly against the cleats.

Instead of securing the cleats to the body panels as shown in Fig. 16, they may be secured to the end panels as shown at 59, 59 in Fig. 19. The said cleats 59 are preferably spaced slightly inward from the edges of the panels so as to form a continuous ledge 60 against which the ends of the body panels will abut, when assembled therewith.

In Fig. 21, a modified end blank structure is shown, in the construction of which is involved the method of forming a diagonal wire binding when more than two binding wires are used.

This end blank comprises two outside wires 62—62, and an intermediate wire 64, all of which are secured to the end panels 66—68 by means of staples 70. The end wires 62—62 are made longer than the intermediate wires 64, to permit them to be drawn together at the center and twisted around the said intermediate wire.

Various changes can be made in the details of construction here shown and described as forming the several embodiments of my invention, any such modifications still being within the scope of the invention here claimed if the principles of construction and results above explained are substantially preserved.

Broadly stated, the main novel features of my invention comprise the following: (1) the stapling or equivalent fastening of certain continuous loops of binding wire to both end panels of a box, as distinguished from prior art structures in which all binding wires were stapled to the body blank and merely stretched across the end panels; (2) the use of certain continuous loops of binding wire so arranged that each loop extends completely around the box, endwise thereof, and has its free ends twisted or fastened together at one side of the box, as distinguished from box-end holding wires made in two sections, the four free ends of which had to be twisted together, two at each box end.

It is apparent that the arrangement hereinabove described is much simpler and cheaper and more efficient than were those of the prior art having the features also above referred to.

Having described my invention, I claim

1. In a wire bound box, the combination of a body blank, comprising a plurality of wire bound panels, one of which is adapted to form a hinged box cover, with an end wall blank, comprising two wire bound panels in spaced relation, which blanks are adapted to be formed into a box having a cover portion left open for packing, with the ends of the binding wires free, together with removable means for retaining the said blanks in box shape in that condition while packing is being done, and means for securing the box in closed condition after packing is completed.

2. A wire bound box comprising the combination of two blanks, one a body blank consisting of

a plurality of panels having binding wires attached to one surface thereof, and the other an end wall blank having two end panels joined together in spaced relation by binding wires having long free ends, which said blanks are adapted to be formed into a box with an open top, and removable means for retaining said blanks in open box formation while being packed; said projecting ends on said binding wires being adapted to be spliced together when said top is closed to secure the box blanks together and in closed position after packing is completed.

3. A wire bound box comprising in combination side, top, bottom and end panels having binding wires attached to a pair of oppositely disposed panels but not to another intervening panel over which they are stretched and crossed to provide diagonal bracing for the completed box.

4. A wire bound box such as defined in claim 3, in which said wires are crossed along both top and bottom panels.

5. In a wire bound box, the combination of top, bottom, side walls and end walls, with two sets of binding wires, one set being attached to the end panels only, but extending across them and lengthwise of the box, and the other set being attached to and extending across the other panels and around the box, in planes at right angles to the longest dimension of the box, the free ends of the wires of the first mentioned set being long enough to be spliced together and thereby formed into loops encircling the box in a direction lengthwise thereof.

6. A combination such as defined in claim 5 in which the end portions of the end panel wires have been crossed before splicing.

7. A wire bound fibre box, comprising a two blank structure composed of one body blank, formed of a sheet of fibrous material scored to create a plurality of panels adapted to form the sides, bottom and cover of said box, combined with one end blank formed of two end panels parallel one to another joined together by binding wires, with an unoccupied space between them substantially equal to the length of such box and continuous binding wires attached to the body blank, hinged tabs projecting from the edges of said end panels and adapted to engage the ends of said body panels when the parts are assembled.

8. In a wire bound box, the combination of a body blank, comprising four panels, flexibly joined together by means of binding wires secured to one surface thereof, with an end blank which comprises two panels joined in parallel relation by binding wires with an unoccupied space between them substantially equal to the length of such box, said blanks being adapted to be formed into a box with an open top, and adapted to be retained in said box formation, while being packed, by the joined binding wires on the end panels, and secured after it is packed and the top closed, by splicing together the projecting ends of the binding wires on the side panels.

9. A wire bound box such as defined in claim 8, further comprising cleats secured to, and at predetermined distances from the adjacent ends of each of the side, top and bottom panels, whereby a portion of the end of each of said panels projects beyond the cleats and overlap the end panels when the box is assembled.

10. A wire bound box such as defined in claim 8, further comprising cleats secured to the inner surface of said end panels to reinforce the end corners of the box, said cleats being spaced

distance in from the edges of the panels equal to the thickness of the side panels, whereby said side panels will lie against the cleats and their edges will abut against the end panels when the box is assembled.

11. A wire bound box consisting of only two cooperating blanks in combination, one blank being composed of a plurality of panels severally adapted to form the bottom, sides and top of the box, and the other comprising a middle panel having substantially the same outline as the box bottom, and two end pieces adapted to close the box ends when the blanks are placed one upon the other with the two bottom panels in registry, each of said sets of panels being strung upon a set of originally parallel wires, the overall width of each of said sets of wires being less than the maximum dimension of the completed box.

12. As a new article of manufacture, a blank for use in making a wire bound box consisting of two end panels separated by an intervening open space substantially equal to the length of such proposed box and fastened to a plurality of wires, each of which extends along those faces of said panels which will be on the exterior of such box and is fastened thereto: whereby, after the top, bottom and side panels of such box have been assembled in position, said end panels may

be placed in the ends thereof while still connected together by said wires.

13. An article of manufacture such as defined in claim 12 in which the free ends of said wires project beyond the ends of said blank far enough to jointly exceed the length of such proposed box: whereby, when said panels are in position in the completed box said wires may have their free ends twisted together and thereby extend around such box lengthwise thereof.

14. An article of manufacture such as defined in claim 12 in which said wires are twisted together at a point intermediate said panels.

15. As a new article of manufacture, a wire bound box consisting of one body blank formed of top, bottom and side panels held in proper relation one to another, and another end-wall blank formed of two end panels separated by an intervening open space substantially equal to the length of the box and which are fastened to a wire which extends along their outer faces and lengthwise around the box.

16. An article of manufacture such as defined in claim 15 in which the panels in said body blank are connected to a wire extending around the box at right angles to that connecting said end panels and having its ends twisted together.

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