June 13, 1944. L. W. BAUER 2,351,092

LOCK END WIREBOUND SHIPPING CONTAINER

Filed May 9, 1941 2 Sheets-Sheet 1

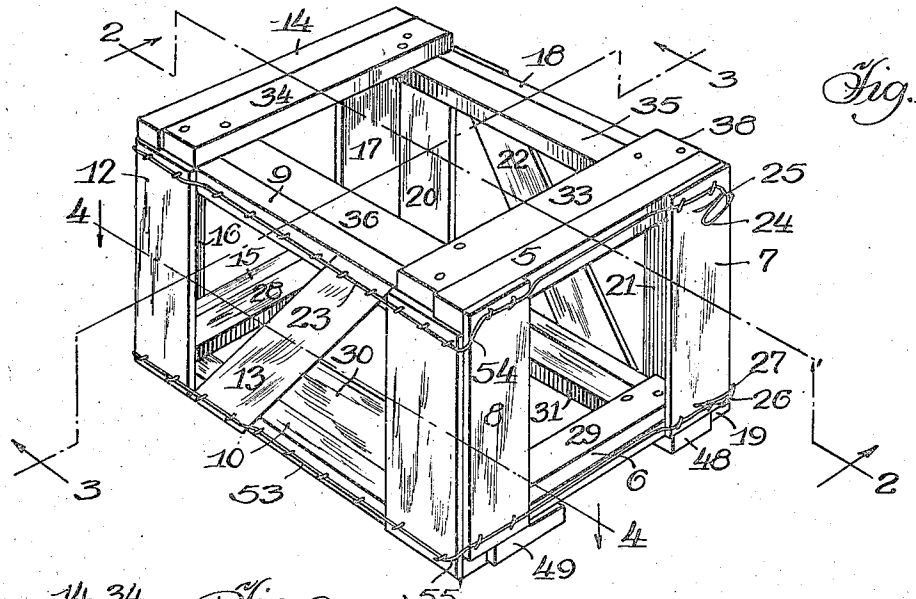


Fig. 1.

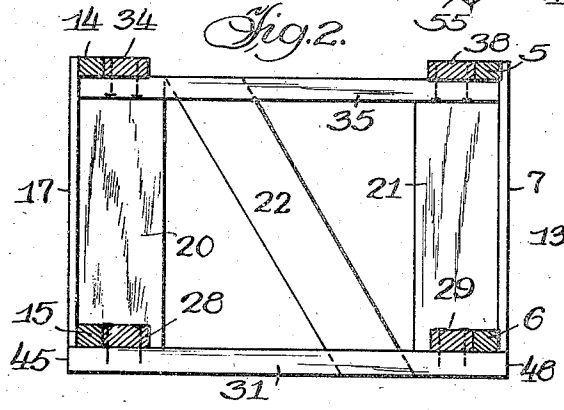


Fig. 2.

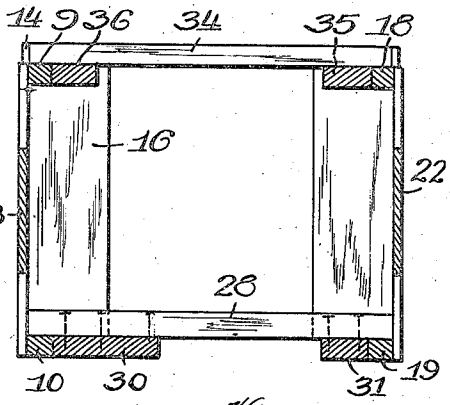


Fig. 3.

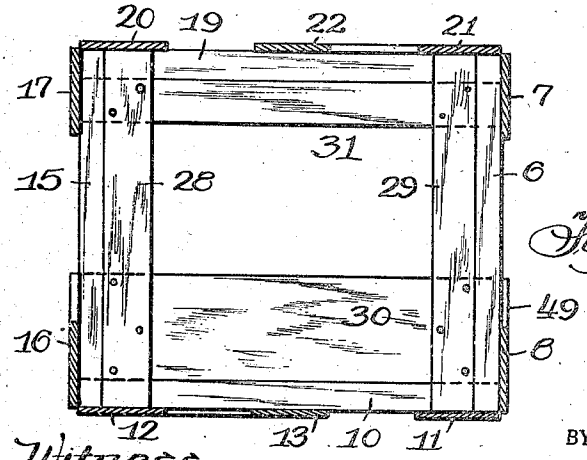


Fig. 4.

Witness:
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Fig. 5.

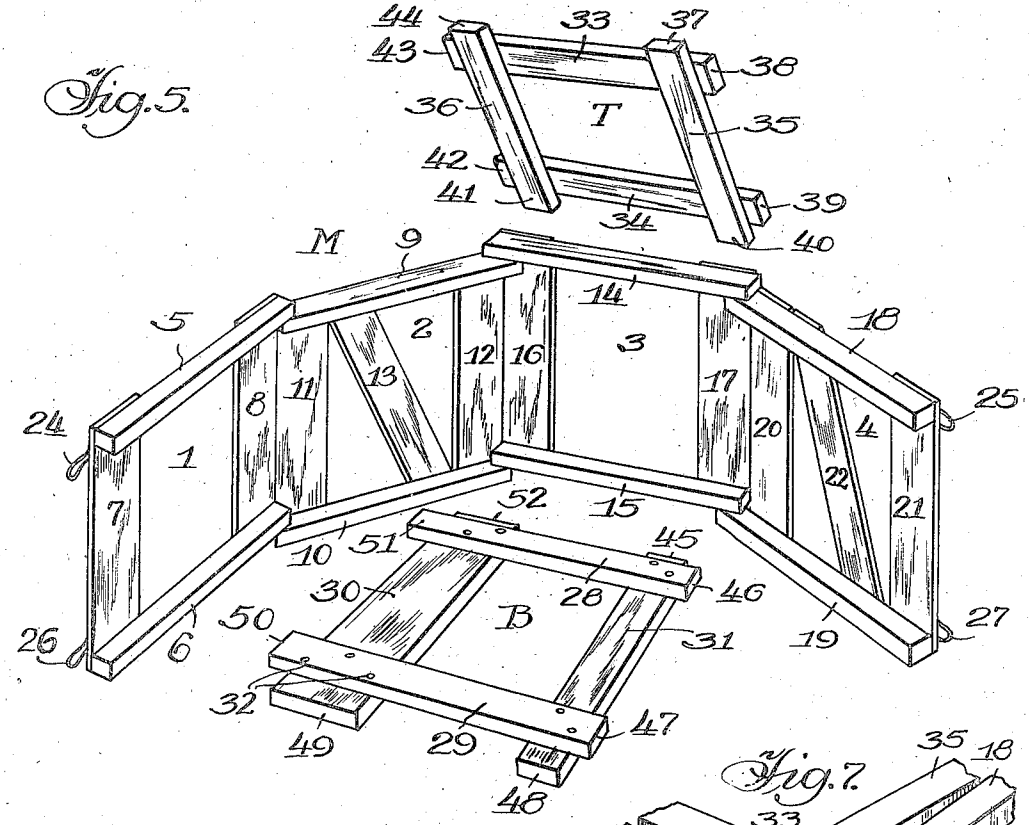
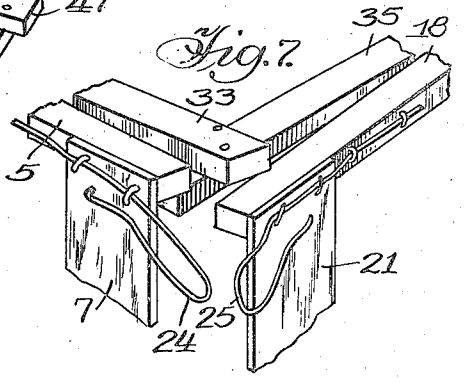


Fig. 7.



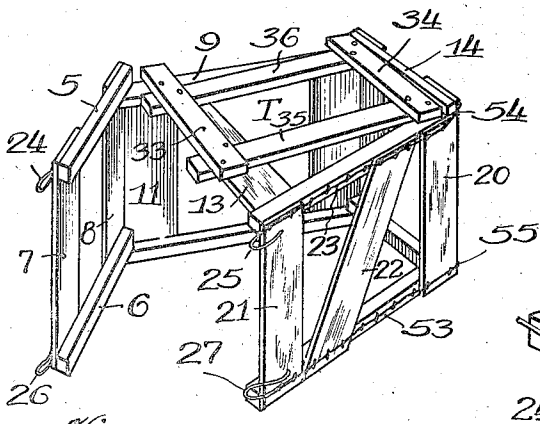


Fig. 6.

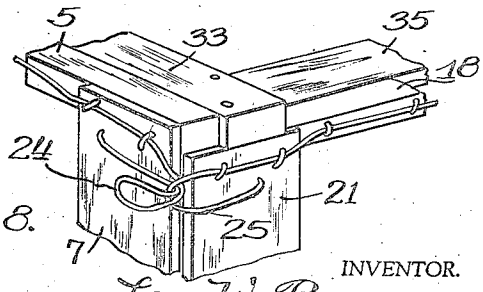


Fig. 8.

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Patented June 13, 1944

2,351,092

UNITED STATES PATENT OFFICE

2,351,092

LOCK END WIRE-BOUND SHIPPING CONTAINER

Len W. Bauer, Paterson, N. J., assignor to General Box Company, Chicago, Ill., a corporation of Delaware

Application May 9, 1941, Serial No. 392,635

4 Claims. (Cl. 217—36)

This invention relates to a shipping container, and more particularly to a nailless, wirebound crate, box or the like for shipping various types and shapes of articles, and is especially adapted for the shipment of a single heavy commodity such as an electric motor, electric transformer, stove, washing machine, refrigerator, oil burner and many other articles where the product is usually mounted on a base.

If desired, the article to be shipped is first mounted securely to a base, and the bases with an article secured to each placed upon a conveyor, and the wirebound mat forming the sides of the crate or container are wrapped around the article and base, the top also being placed in position during the wrapping operation on the conveyor. If preferred, however, the assembling of the crate or container may be effected independently of a conveyor. My invention adapts itself to such conveyor assembling, thus making possible very considerable economy in the assembling operation.

The present invention enables the wrapping of the wirebound mat forming the sides around the article to be shipped and the top and bottom closures in such manner as to effectively protect said article during shipment as well as to eliminate the necessity of driving nails between the end closures and the side sections except in extreme cases involving articles of considerable weight.

Among the objects of my invention is to eliminate the disadvantages present in shipping containers heretofore known, and to accomplish the advantages set forth above.

Another object of my invention is to provide a shipping container in which the sides form sections of a wirebound mat embodying the lateral alternate offsetting of the cleats to enable folding of the mat without the necessity of mitering the ends of the cleats.

A further object is to provide a shipping container of the class described enabling the double overlocking of the ends of the closure cleats to the cleats of the side sections so as to lock the end closures of the container against displacement in all directions without the necessity of driving nails between the closure cleats and the side section cleats.

A still further object is to provide for an angular pull of the binding wires at the corner edges of the side sections to resist sidewise strain in the container during shipment.

Another object is to provide a wirebound shipping container that is economical, simple, efficient, easy to apply to the article being shipped and that will give a strong interlocking action between the end closures and side sections when the container is secured in closed position.

Other objects, advantages and capabilities inherent in the present invention will later become more readily apparent.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while I have shown therein preferred embodiments of the invention I wish it understood that the same are susceptible of modification and change without departing from the spirit of the invention.

In the drawings:

Figure 1 is a perspective view of a closed shipping container embodying my invention.

Fig. 2 is a vertical longitudinal section on the line 2—2 of Fig. 1.

Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 1.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 1.

Fig. 5 is a disassembled perspective showing the wirebound side mat and the two end closures in separated positions prior to the container being closed.

Fig. 6 is a perspective view showing the folding of the wirebound side mat around the top closure just prior to the completion of such closing operation, and with the lower closure omitted for the sake of clearness.

Fig. 7 is a fragmentary perspective view just prior to the completion of the folding operation of the upper corner of the container at the meeting ends of the wirebound mat.

Fig. 8 is a view similar to Fig. 7 but showing said corner after the closing operation is completed.

As seen in Fig. 5, which illustrates the three main parts of the container prior to their being connected in folded position, my container comprises a wirebound mat indicated generally at M having four vertical side wall sections 1, 2, 3 and 4, side wall section 1 being formed with the upper longitudinal cleat 5, lower longitudinal cleat 6 and vertical slats 7 and 8. Section 2 comprises the upper longitudinal cleat 9, the lower longitudinal cleat 10, the vertical slats 11, 12 and the diagonal bracing slat 13. Section 3 comprises the top longitudinal cleat 14, the bottom longitudinal cleat 15 and the vertical slats 16 and 17. The section 4 comprises the top longitudinal cleat 18, the bottom longitudinal cleat 19, the vertical slats 20 and 21 and the diagonal bracing slat 22. The ends of the slats of each of the side wall sections are fastened to their respective top cleats by staples driven over the wire 23 which extends throughout the length of the mat as seen in Figs. 1 and 6, and projects beyond the free end of cleat 5 in the form of a loop 24 and beyond the free end of cleat 18 in a loop 25, which loops may be passed one within the other, the inner loop being bent over the

outer loop for securing the side walls into position over the end closure walls and over the article being shipped when containing the container.

The bottom ends of the slats are likewise secured to the respective bottom cleats by a similar wire in a similar manner, which latter wire is also provided with extending loops 26, 27 for a similar purpose. Fig. 7 shows two of these loops just prior to their being secured together, and Fig. 8 shows the same after being secured together upon completion of the closing operation.

As seen in Fig. 5, cleats 5, 9, 14 and 18 of the side wall sections are alternately laterally offset with relation to the next adjacent top cleat, and the bottom cleats 6, 10, 15 and 19 are likewise similarly laterally offset with the side faces of the adjacent adjoining ends of the cleats in sidewise contact with each other and offset from each other the thickness of the cleat. In other words, these adjoining adjacent cleats are not in longitudinal alignment but are offset with relation to each other a sufficient distance to permit them to contact each other laterally at their ends, and at the same time permit each side wall section to be folded with relation to its adjacent side wall section during the closing of the container around an article to be shipped, which will be preferably fastened in any appropriate manner to the bottom closure B which comprises the two connected sets of parallel cleats fastened one above the other, one set being cleats 28 and 29 and the other set being the cleats 30 and 31. As seen in Fig. 5 the ends of the cleats of these two connected sets of parallel cleats extend beyond the side of the adjacent cleat so that at each of the four corners there are two extending cleat ends positioned at right angles to each other, one of these ends being above the other. The two sets of parallel cleats are secured together by nails, screws or other suitable fastening means 32 to form a rigid unit.

A similar construction is seen in the top closure designated generally at T in Fig. 5, and likewise comprises two connected sets of parallel cleats one set being the cleats 33 and 34 and the other set being the cleats 35 and 36. The top closure T like the bottom closure B is also provided at its corners with extending ends in different planes. For clarity the extending ends of the cleats in the top closure T are designated 37, 38, 39, 40, 41, 42, 43 and 44, while the extending ends of the cleats in the bottom closure B are designated as 45, 46, 47, 48, 49, 50, 51 and 52. The binding wire for the bottom cleats of the side sections is designated generally as 53 and like that of the top cleats is secured to the respective cleats by staples which also secure the lower ends of the slats to the longitudinal cleats of the side sections. The ends of the wires protrude in loop or other formation at 26 and 27 as described above. The wires at the top and bottom of the mat forming the side sections in passing from the lower of the offset cleats to the higher of the offset cleats extend angularly as seen at 54 and 55 in Fig. 1. This angular disposition of the wires at the joints gives added resistance against side strain when the container is closed around an article to be shipped. If desired, the cleat 30 of the bottom closure B may be wider than the cleat 31 to facilitate the fastening thereto of an article to be shipped, it being understood that such article may be secured to one or both of the bottom cleats as desired, and that such cleats may be of any suitable width to accommodate the particular article being shipped.

The operation of closing the container walls and end closures around the article to be shipped (it being preferably understood that the article to be shipped will be already secured to and resting upon the bottom closure B) will be best understood from an inspection of Fig. 5, in which it will be understood that the side wall sections 1, 2, 3 and 4 will be folded around the bottom closure B and simultaneously around the top closure T, the latter being held in proper position during the folding operation. First the side wall section 3 will be moved to bring cleat 15 above the projecting cleat ends 45 and 52 so that the cleats 15 and 28 substantially contact each other laterally with the extending cleat ends 45 and 52 being positioned beneath longitudinal cleat 15. At the same time the top cleat 14 will be moved substantially into contact with the cleat 34 of the top closure T with the extending cleat ends 40, 41 extending beneath the longitudinal cleat 14 of the side wall section 3. Continued swinging of side wall section 2 into position toward the bottom and top closures will carry the longitudinal cleat 10 against the cleat 30 of the bottom closure and also position the extending cleat ends 50 and 51 above cleat 10, and at the same time move longitudinal cleat 9 against cleat 36 of the top closure T and carry the extending cleat ends 42 and 43 above longitudinal cleat 9.

Swinging of side wall section 4 toward the bottom closure and the top closure will carry cleat 19 against cleat 31 and at the same time move the extending cleat ends 46 and 47 closely over the top of longitudinal cleat 19 while the top cleat 18 is moving against cleat 35 of the top closure T and the extending cleat ends 38, 39 are moving over and closely against the upper surface of cleat 18 of the side wall section 4.

Finally side wall section 1 will be swung into position against the bottom closure B and the top closure T with the longitudinal cleat 6 touching against cleat 29 and the top longitudinal cleat 5 touching against cleat 33, while the extending cleat ends 48 and 49 will be below and in contact with cleat 6 and the extending cleat ends 37 and 44 will be below and in contact with cleat 5. The loops 24 and 26 are then pushed through loops 25 and 27 and bent backwardly a desired amount, upon which the closing of the container is completed.

Fig. 6 shows this closing operation (the bottom closure B being omitted for the sake of clarity) nearly completed around the top closure T, while Fig. 7 shows the upper corner of the container at the meeting ends of the wirebound mat forming the side walls nearly closed, while Fig. 8 shows the latter mentioned parts closed and fastened together by the bending of the loop 24 through loop 25, it being understood that during this fastening action loop 26 will be passed through loop 27 and bent over the same as described earlier herein.

With the closing of the container walls and top and bottom closures completed as described above, it will be seen that I have provided a container in which the longitudinal cleats of the side wall sections which form a wirebound mat are laterally offset with relation to each other, and the projecting ends of one set of the parallel cleats of each of the top and bottom closures

are above two of the longitudinal cleats of the opposite side walls, while the ends of the other set of parallel cleats of both the top and bottom closures are below the longitudinal cleats of the other pair of parallel side wall sections. This results in a construction that firmly holds each of the top and bottom closures in position without the necessity of driving nails through the various cleats, and also eliminates the necessity of forming tongues and grooves in the meeting parts. This provides a very simple, economical, easily and quickly closed and at the same time strong shipping container which can be reused many times if desired, and one in which nails are not necessary to hold the ends in position, any nailing that might be suggested being used only when the container is expected to support heavy loads, such nailing being for the purpose of providing resistance to weaving but is not necessary to the main lock-in feature of this invention.

It will be understood that the shape and size of the container will be such as to accommodate various sizes and shapes of articles to be shipped, and while I have shown for illustrative purposes the container as having four side walls it will, of course, be understood that any other number of side walls could be used where the same would suit the shape and size of the article to be shipped. This gives an effective interlocking of the top and bottom end closures without necessity of complicated structural parts, and at the same time such end closures are very strongly connected to the side wall sections without the necessity of nails, screws or the like.

If the container is used for shipping articles of undue weight the meeting cleats of the top and bottom closures can, if desired, be further fastened together by additional fastening means such as nails, screws, bolts or the like, where such additional strength is deemed necessary. In the majority of instances, however, such fastening by nails, screws or the like will not be necessary and is only advised in extreme cases, which would be the exception to the rule. Also the angular disposition of the binding wire at the folding edges of the side wall sections will provide sufficient strength to effectively hold these parts together, and at the same time enable the wrapping of the side wall sections around the top and bottom end closures and the article to be shipped when closing the container.

If desired, the extending ends 46, 47, 50 and 51 of the bottom closure B may be omitted and the sides folded around the top closure, as described earlier herein, and fastened thereto by bending the ends of the wires, after which the completely folded mat with the top closure locked in position may be lowered over the article to be shipped fastened on the bottom closure, after which the bottom cleats of the sides may be securely nailed to the bottom closure.

Having now described my invention,

I claim:

1. A wire bound shipping container comprising a plurality of sides, each of said sides having longitudinally extending cleats along two parallel edges to form two sets of cleats, one along each edge, the cleats of each set being alternately offset laterally so that the adjacent ends can be folded with relation to each other, slats extending across the cleats of each side, wire secured longitudinally along the cleats and over the slats to extend beyond the farthermost end of each of the end cleats, the adjacent cleats being out of longitudinal alinement to enable folding of the sides with relation to each other, said wire extending angularly from one cleat to the next at the folding joints, means for securing the wire to the cleats and slats, ends for said container, said container ends each having two pairs of crossed parallel rigid cleats of substantial thickness and formed with projecting ends, the ends of one pair of the crossed cleats extending outside of the cleats of two of the sides, and the ends of the other pair of crossed cleats extending inside of the cleats of two other of said sides, each of the crossed cleats of each of said container ends laterally contacting with an adjacent cleat of one of the sides to form a strong container for heavy objects.

2. A wire bound shipping container for articles of considerable weight, comprising a plurality of foldable sides each having a pair of cleats, the cleats of each side each being laterally offset from an adjacent cleat of the next side, slats extending across the cleats of each side, wire secured longitudinally along the cleats and over the ends of the slats and extending angularly from one cleat to the next at the folding joints, ends for said container, said ends each having two pairs of crossed parallel rigid cleats of substantial thickness and formed with projecting ends adjacent the corners of the container ends, the ends of one pair of the crossed cleats extending outside of the cleats of two of the sides, and the ends of the other pair of crossed cleats extending inside of the cleats of two other of said sides, each of the cleats of each container end laterally contacting a cleat of one of the sides.

3. A shipping container comprising a plurality of sides each having a pair of cleats, the cleats of each side each being laterally offset from an adjacent cleat of the next side, slats extending across the cleats of each side, ends for said container, said ends each having two pairs of crossed parallel rigid cleats of substantial thickness and formed with projecting ends adjacent the corners of the container ends, the ends of one pair of the crossed cleats extending outside of the cleats of two of the sides, and the ends of the other pair of crossed cleats extending inside of the cleats of two other of said sides, the outside edge of each of the cleats of each container end substantially contacting the inside edge of a cleat of one of the sides.

4. A wire bound shipping container that can be closed and fastened without the necessity of nails and the like, comprising a wire bound mat forming side wall sections having cleats and elements of side walls, wires foldably securing said sections together, said cleats being alternately laterally offset, a base in said container adapted to carry an article being shipped, and a cover for said container, each of said base and cover cleats having a pair of parallel rigid cleats extending one way and another pair of parallel rigid cleats extending crosswise thereto, all of said base and cover cleats being of substantial thickness and having extending ends, the ends of one set of said parallel base and cover cleats extending under certain side wall cleats and the ends of the other set of said base and cover cleats extending over certain other side wall cleats as the side wall sections are folded around the base and cover, each of the cleats of the base and cover laterally contacting a cleat of the adjacent side wall section.

LEN W. BAUER.

4

CERTIFICATE OF CORRECTION.

Patent No. 2,351,092. June 13, 1944.

LEN W. BAUER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 61, claim 4, before "having" strike out the word "cleats"; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 15th day of August, A. D. 1944.

Leslie Frazer

(Seal) Acting Commissioner of Patents.