

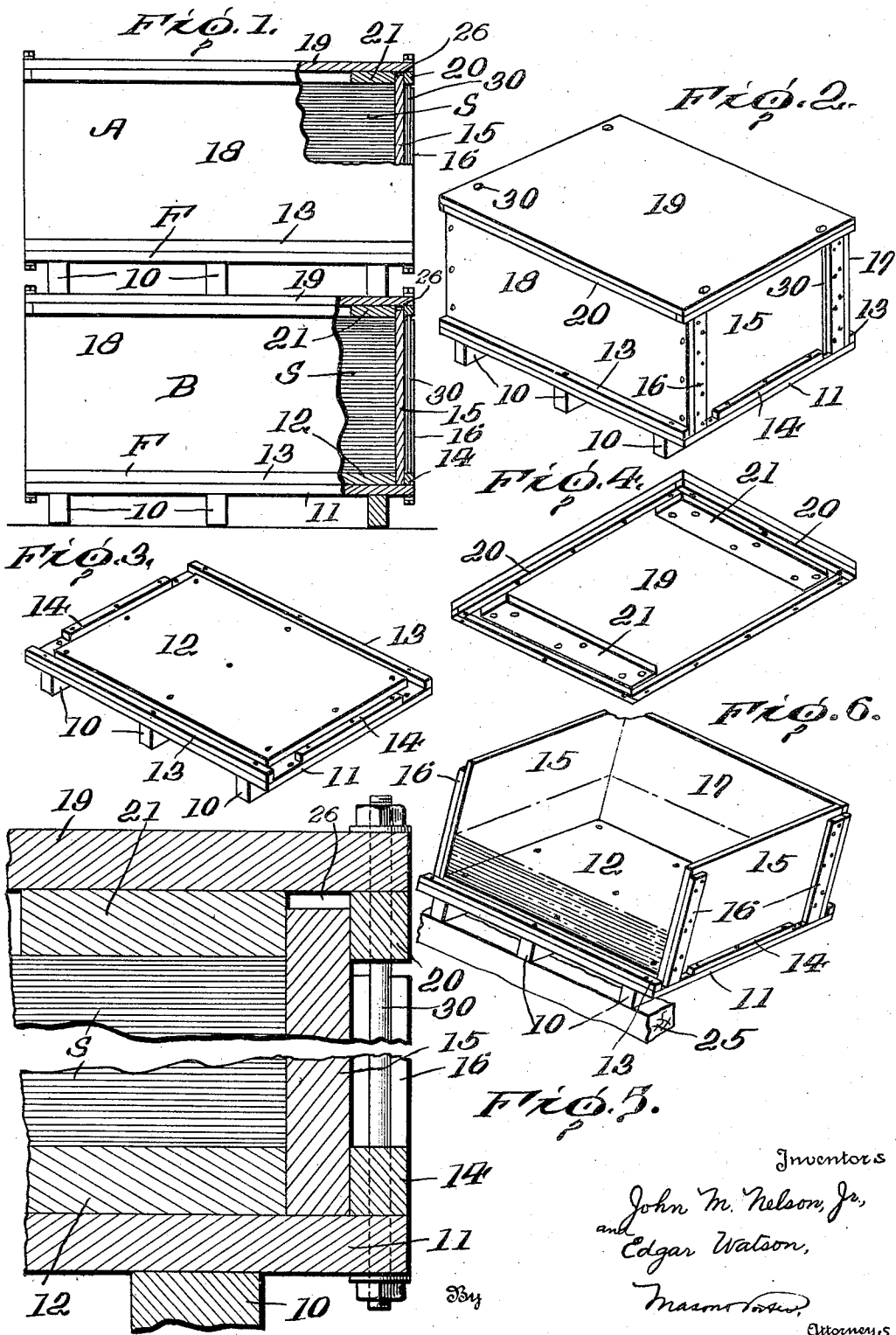
Nov. 15, 1938.

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2,137,142

CONTAINER FOR SHEET MATERIALS

Filed Nov. 11, 1936



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UNITED STATES PATENT OFFICE

2,137,142

CONTAINER FOR SHEET MATERIALS

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Application November 11, 1936, Serial No. 110,394

2 Claims. (Cl. 206—60)

This invention relates to improvements in containers for the transportation and storage of sheet materials, and is particularly of value in the handling of sheet materials which must be protected against atmospheric conditions, and against the rubbing of one sheet upon another.

In practice, when it is sought to handle and ship sheet materials, more particularly those which are of great weight (such as tin plate), it is necessary to provide means whereby several containers may be superimposed upon one another, and the superimposed load transmitted downwardly to the floor. Since these materials differ considerably in gage or thickness, certain tolerances must be provided, and hence an entirely rigid structure must be constructed with walls of sufficient strength to support a heavy superimposed load, even under the conditions of acceleration effects such as occur during shipment by sea.

Since the customary manner of shipping such products is to employ a structure which is discarded at the point at which the package is opened and the sheets distributed, it is essential that the cost shall be low. Further, since the shipments are often made under conditions at which a moist atmosphere is encountered, and sometimes the packages are exposed to the rain, it is essential in the design of the package to provide an adequate protection against soiling or other deterioration of the sheets.

The present invention comprises the provision of means for enclosing a stack of such sheet material, and providing therewith an adequately closed and protected package which is capable of sustaining a heavy superimposed load.

An illustrative form of practicing the invention is set out on the accompanying drawing, in which:

Figure 1 is a view on a small scale, indicating the superposition of the packages.

Figure 2 is a perspective view showing the assembly of parts in a single package.

Figure 3 is a perspective view of the platform portion of the structure.

Figure 4 is a similar perspective view of the cover portion.

Figure 5 is an upright longitudinal section, on a large scale.

Figure 6 is a perspective view showing the arrangement and position of the parts during the filling of the container.

In the drawing, Fig. 1 illustrates the packages A, B superimposed upon one another, parts of these packages being broken away to show that

the pile of sheets S in each container rests solidly upon the floor structure F of this container, and that the weight is transmitted largely at the ends of each package, being transferred from the skids of an overlying package to the cover of the adjacent underlying one, and then directly to the pile of sheets S, and from this in turn to the floor F of this lower package, and thus to the lower skids. Since with many sheet materials (and normal tin plate in particular) the operations of trimming the sheets results in the forming of a curl at the edge, it is customary that the stack of sheets is higher at its ends than at its middle, as indicated in Fig. 1. Hence the floors F, the skids and the covers of the packages operate together in transferring the central load toward the ends, so that the loading at central portions of the containers is relatively low, and there is substantially no bending of the cover structures nor considerable loads upon the side walls.

Each package comprises the contents and the enclosing structure forming a container. Each container is illustrated as having the three skids 10 which extend in the direction of the minimum dimension of the rectangular sheet, in this illustrative form, and are spaced sufficiently apart so that the usual arms of the handling truck can be introduced thereunder for lifting the package and transporting it as desired, and are also serviceable for permitting the easy release of sling chains when the devices are lifted by a crane or like structure. On top of these skids is provided a bottom member 11 which is larger than the size of the sheet to be contained, and is rectangular when the sheet is rectangular. Upon this bottom member 11 rests a false bottom member 12 which is substantially identical in size with the size and dimensions of the sheets to be transported. With tin plate, for example, it is preferred to have the tolerance of excess size of the false bottom 12 of the order of one-sixteenth of an inch for a sheet which is about eighteen by twenty-eight inches. In the particular illustrated form, ribs 13 are provided along the longer edges of the bottom member and are fixedly secured thereto, with their inner margins in spaced relation to the adjacent edges of the false bottom member 12. At the ends, rib pieces 14 are provided in rigidly secured relation, but terminating short of contact with the ribs 13; these pieces 14 likewise are spaced away from the adjacent edges of the false bottom member 12.

The end walls 15 are constructed with the marginal vertical battens 16 which have their lower ends received in the spaces at the ends of

the rib pieces 14, while the lower edge of the end walls 15 are received in the grooves between the pieces 14 and the false bottom member 12. A rear wall 17 is provided, with its longitudinal dimension substantially equal to the length of the bottom member 11. The front wall 13 is preferably identical with the rear wall 17.

The cover comprises the upper closing member 19 which is provided at its lower surface with the rib or skirt pieces 20 which provide a downwardly extending flange along the periphery of the entire structure, the inner walls of this flange closely conforming with the position occupied by the outer surfaces of the front, end and rear walls. In addition, this cover member contains the pressure battens 21 which are of substantially the same length as the horizontal dimension of the adjacent end wall, and are so located as to provide a groove at the end wall for the reception of the top edge thereof.

Normally, the bottom structure of Fig. 3 and the top structure of Fig. 4 are manufactured independently, in association with the independent manufacture of the parts constituting the front, end and side walls, and may be shipped in this condition to the packaging plant. It is, however, possible to assemble the two end walls with the back wall to provide an open U-shaped structure prior to shipment.

In any event, when the parts are brought into the shipping room, the preferred manner of procedure is to mount such a U-shaped member in position on the floor structure 3, with the lower edges of the end walls and of the rear wall in the grooves provided just inside of the rear rib 13 and of the rib pieces 14. The material is then introduced into the opened structure thus provided (as shown in Fig. 6). In the shipment of tin plate, the customary procedure is to manufacture the plate and then clip or cut it to the desired size. It is then given a final inspection immediately before packaging. For this purpose, a pile of the sheets is positioned in front of a worker, who takes the sheets one at a time and inspects the upper and lower surfaces thereof. Experienced workers perform this operation very rapidly. The sheet is then introduced into the assembly of Fig. 6, and is caused to abut against the walls, so that the sheet falls correctly into position upon the bottom, or upon the next preceding sheet. Owing to the clearances between the walls, this results in the quick formation of an accurate stack of material. It is often advantageous to slightly raise the open or front side of the container by means of a block 25 (Fig. 6), which sometimes assists in assuring that the front edges of the sheets will be at a uniform position.

Usually, the inspector has two such containers at hand, and delivers "grade A" sheets into one of them, while "grade B" sheets are placed in another.

The containers are designed on the basis of the gage of the material and the number of sheets which are to be placed therein. When tin plate is being shipped, it is customary to have the height from, say, eleven to fourteen inches, depending upon the area of the particular sheets. This means that a package will be of very great weight, such as one or two tons.

When the inspector has filled the container to the desired height, which is somewhat less than the height of the vertical walls, a shipping clerk utilizes a truck to remove the filled container, and its position is then taken by an empty container. The withdrawn container then receives the front

wall 18, which is slipped into the front groove on the bottom structure. The cover is then applied, its peripheral flange portions 20 coming outside of the vertical walls (Fig. 5); while the weight-transmitting battens 21 come down upon the pile of sheets within the container. In the design and packaging, the sheets come to such an elevation with respect to the upper margins of the side walls that the space 26 is left thereat, in order that the weight of the cover 19 may not come against the upper edge of the walls 15, 17, 18.

Bolts 30 are then passed through apertures provided in the bottom member 11 and the member 19, and with the use of proper washers, these bolts are drawn tight. Since these bolts may be formed by threading each end of round steel stock of the proper length, they are very inexpensive. They are preferably located close to the angles provided by the battens 16 and the walls 15, whereby they are protected against mechanical damage. The operation of drawing these bolts down assures a tight engagement of the weight-transmitting battens 21 with the stack of sheets, at the ends of these sheets where the thickness of the pile or stack is greatest: while still leaving a space 26.

The packages thus closed may be moved onto cars, or transported or stored otherwise. The superposition of these packages gives no difficulty, and the superimposed packages accurately transmit their weight through the floors, skids and top walls, so that the weight is supported within each container by the pile of sheets therein: the space 26 being maintained even under extremely heavy loads.

The closed and bolted package has the upper and lower edges of the vertical walls sealed by the close-fitting engagement of the margins of these vertical walls in the grooves provided at the bottom and top structures of Figs. 3 and 4, and it will be noted that the stack of sheet material has its lower surface well above the lower edges of these vertical walls, so that leakage does not run directly to the lowermost sheets; while the general arrangement prevents the penetration of the driving rain into the interior of the package.

It is preferred to manufacture the parts of wood, for the reason that wood has a certain supporting and cushioning effect without damage to the edge of the sheets, and prevents damage by the action of a sling chain or the like along edges of the package. In manufacturing the container of wood, the various parts may be made of simple shapes, each of the parts being essentially a rectangular parallelepipedon, so that the container may be manufactured with the least wastage and scrap. The skids are properly located, the bottom member 11 placed thereon, and the false bottom positioned: these parts are then nailed tightly together. Similarly, the ribs and rib pieces are positioned and nailed. The forming of the holes for the bolts 30 may be effected prior to the assembly of these parts, or after the bottom structure has been completed, as may be the more convenient and expedient. Similarly, the top structure and the end walls are assembled by nailing.

As pointed out above, it is preferred to join two end walls and the rear wall 17 before the start of packaging. For this purpose, the nails may be driven adjacent the vertical edges of the rear wall 17 into the battens 16 and into the adjacent end of the end wall 15.

After fitting the front wall 18 in position, it is preferred likewise to nail it to the adjacent batten 16 and to the adjacent ends of the end wall 15, as shown by the nail heads in Fig. 2.

5 One of the features of the present arrangement is that the ribs, flanges and bolts operate to support the vertical walls, even against considerable impacts of the contained material, whereby it is unnecessary to secure either the
10 upper or lower edges of these vertical walls, and hence the operations of removing the sheets from the container are easy.

The sheets may be readily rendered accessible for withdrawal, by unscrewing the nuts from the
15 bolts 30, and lifting off the cover structure of Fig. 4. This exposes the stack of sheets, and also permits the withdrawal of the four side walls, either individually or as a group, without disturbing the
20 stack of sheets. After the vertical walls are removed, it is possible to inspect the cut edges of each and every sheet in the stack, and to remove these sheets with facility.

25 In making the container of wood, it is found that such woods as poplar and gum are highly satisfactory, as they have an absorbent nature and are effective for preventing destructive condensation directly on the sheets, so that the losses in shipment in the present container are low.

30 The container is of particular virtue and service when employed with heavy sheet material such as tin plate, black plate, and the like; although obviously it may be utilized for other employments.

35 It will be understood generally that the illustrative form is not the only one in which the invention may be practiced, but that many modi-

fications may be made therein within the scope of the appended claims.

We claim:

1. A container for sheet materials, comprising a bottom member providing a floor upon which
5 the stack of sheets may rest, vertical walls secured to said bottom member and supported against lateral movement with respect thereto, compression members engaging the stack of
10 sheets within said vertical walls and extending above the upper edges of the said vertical walls, and a cover member resting on said compression members and maintained thereby spaced above
15 the said upper edges of the vertical walls whereby to relieve the said vertical walls from any superimposed load and to transmit the load through the stack of sheets to said bottom member.

2. A container for sheet materials, comprising a bottom member providing a floor upon which the
20 stack of sheets may rest, vertical walls secured to said bottom member and supported against lateral movement with respect thereto, compression members engaging the stack of sheets within said
25 vertical walls and extending above the upper edges of the said vertical walls, a cover member resting on said compression members and maintained thereby spaced above the said upper edges
30 of the vertical walls whereby to relieve the said vertical walls from any superimposed load and to transmit the load through the stack of sheets to said bottom member, and skids depending from
35 said bottom member and adapted to transmit a superimposed load therethrough to the cover member of another container located thereunder.

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