May 30, 1939. J. J. O'CONNELL ET AL 2,160,461

SHIPPING CRATE

Filed March 5, 1936 3 Sheets-Sheet 1

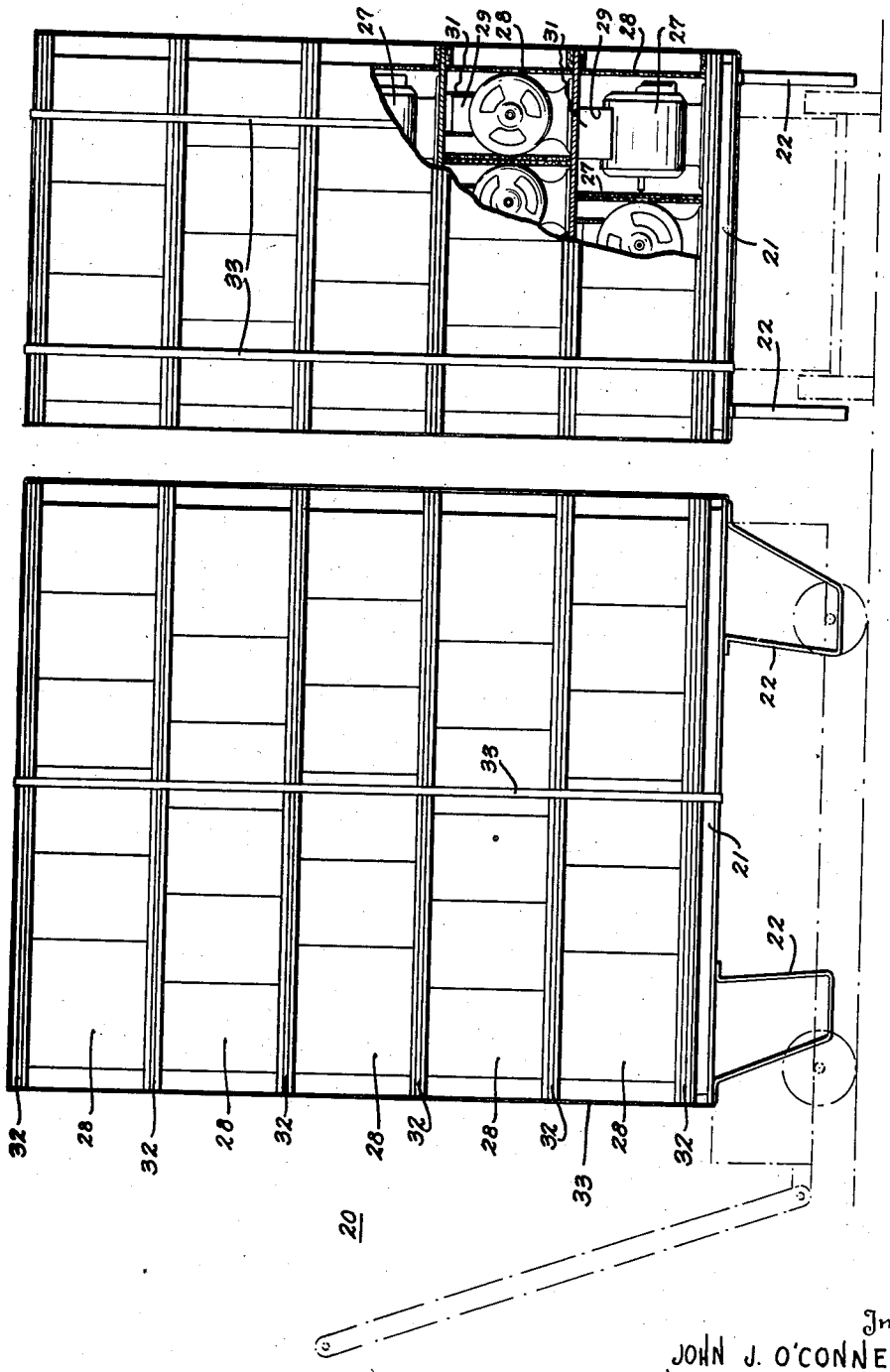


Fig. 2

Fig. 1

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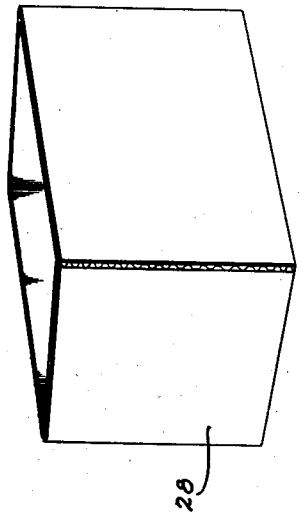


Fig. 5

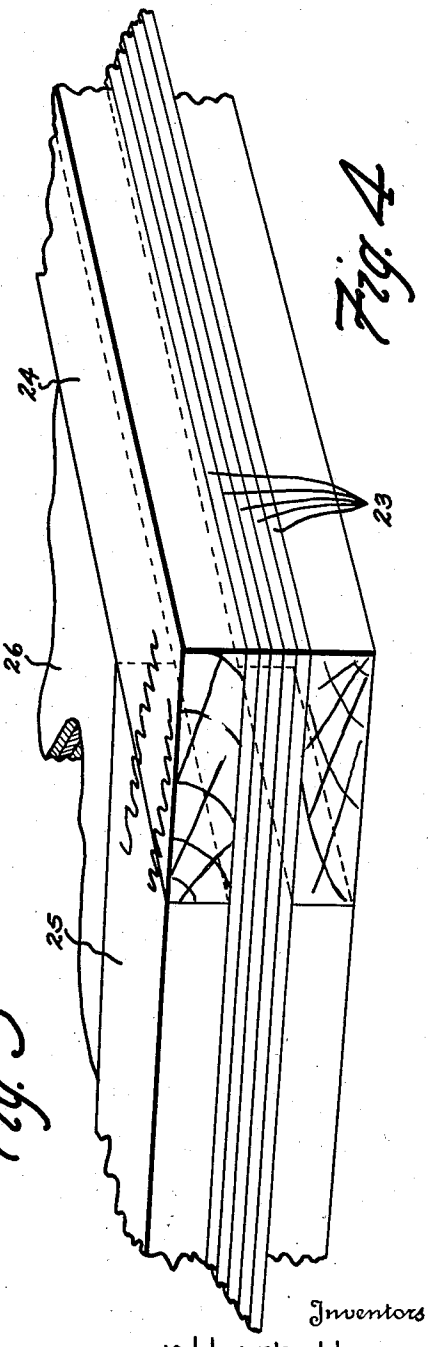


Fig. 4

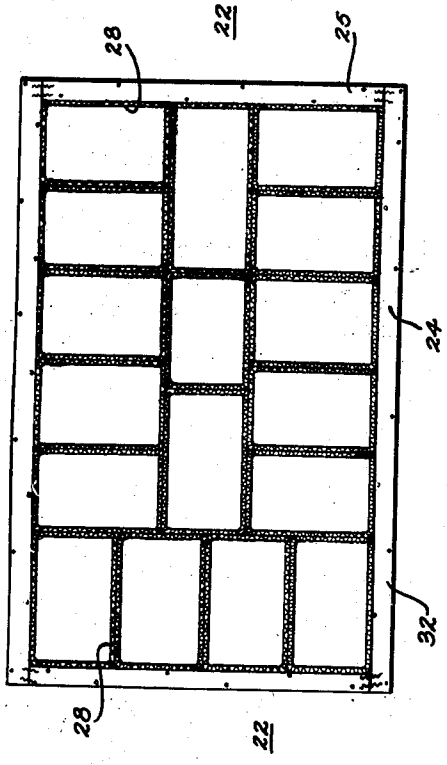


Fig. 3

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Filed March 5, 1936 3 Sheets-Sheet 3

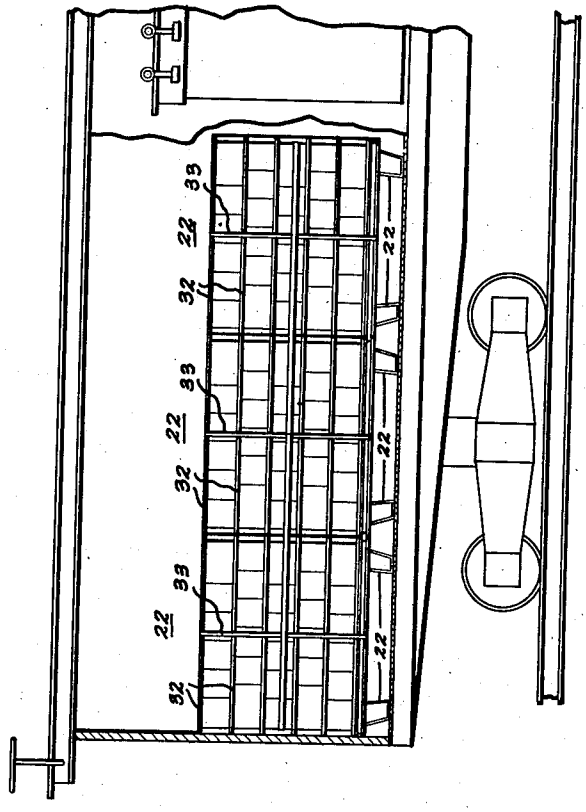


Fig. 6

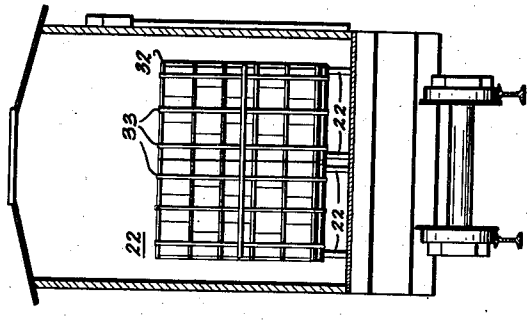


Fig. 7

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UNITED STATES PATENT OFFICE

2,160,461

SHIPPING CRATE

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Application March 5, 1936, Serial No. 67,264

3 Claims. (Cl. 206—46)

This invention relates to shipping crates and more particularly to crates for shipping articles, such as dynamo-electric machines.

One of the objects of the present invention is to provide a crate of minimum weight and dimensions.

Another object of the present invention is to provide an economical way of packing a maximum number of articles, such as dynamo-electric machines having irregular outlines, so that the high finish of the articles will not be marred nor damaged in transportation.

Another object of the present invention is to provide a crate which may be easily loaded, handled and placed in secure position in a transporting vehicle and which, after unloading may be easily assembled in compact form for return shipment to the original shipper.

The objects mentioned above are accomplished by providing a crate, including a skid or base upon which a plurality of separators or trays are adapted to be positioned in stacked relation. These separators include a flat member having longitudinal and cross members secured at the periphery thereof to provide a peripheral ledge thereon. Within the area confined by the peripheral edge a plurality of articles of manufacture having irregular outlines are positioned, for example, dynamo-electric machines having numerous projections, such as, condensers, oilers, bases and the like. Tubular sleeves of suitable fibrous material are placed about the articles and these sleeves are kept from sliding off the separators by the peripheral ledge. After a certain number of separators are placed on the base in stacked relation suitable securing means, such as metal bands are used to hold the separators in a gripping relation against both edges of the sleeves to maintain the sleeves with the articles of manufacture enclosed in a fixed position on the separators.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

Fig. 1 is a side elevation of a crate, on a reduced scale, fully loaded and resting on a lifting truck shown in dotted lines.

Fig. 2 is an end view of a loaded crate looking in the direction of arrow 2 of Fig. 1.

Fig. 3 is a plan view showing one method of assembling the sleeves upon a separator.

Fig. 4 is a perspective view to scale showing a fragment of one of the separators.

Fig. 5 is a perspective view of a sleeve used in present invention.

Fig. 6 is a part longitudinal sectional view of a freight car showing the lengthwise relative positions of a plurality of the shipping crates in the car.

Fig. 7 is a part sectional end view of a freight car showing endwise relative positions of the shipping crates in the car.

Referring to the drawings, **20** designates a shipping crate comprising a base portion **21** having feet **22**. The feet may be secured to the base by bolts, not shown, or in any other suitable manner. The upper side of the base **21** is adapted to support a tray or separator **32**. Each separator **32** is preferably made of wood and comprises a flat member **23**, which may be of five ply wood, longitudinal strips **24** and cross strips **25**. The strips **24** and **25** are also preferably made of wood. It is to be understood that other materials may be used. The strips **24** and **25** are attached to the flat surfaces of the member **23** by nails or screws. The strips **24** and **25** are attached on both sides of the flat member and form peripheral ledges or projections for each side of the flat member **23**. It is to be understood that the strips **24** and **25** may be attached to the member **23** in any other suitable manner so long as they provide a peripheral ledge for the member **23**. For example, the strips **24** and **25** may have grooves intermediate the ends thereof into which the edges of the flat member **23** may extend and be secured.

When one of the separators is placed upon the base portion **21** the upper area **26** of one of the separators is adapted to receive a plurality of dynamo-electric machines **27**. A strip of suitable fibrous material, such as double faced corrugated paper is provided with spaced detents or scores so that the strip can be easily formed into a collapsible tubular sleeve **28**. One of the sleeves is clearly shown in Fig. 5. After the sleeves are formed they are placed about the dynamo-electric machines **27** having numerous projections **31**, such as condensers, oiler and bases.

By referring to Figs. 1 and 2, it may be seen for sake of illustration, the crate **20** is shown loaded with dynamo-electric machine ready to be shipped.

When loading the crate for shipment, the packer first places one of the separators **32** on the base **21**. He then places a plurality of articles **27** in position on the area **26** confined within the

upper peripheral ledges and then places a sleeve 28 about each article. It will be noted that when the sleeves are placed about the articles each article or dynamo-electric machine is protected from each other by a partition and that one or more of the external surfaces of the outer row of sleeves 28 will be near or adjacent the peripheral ledges. The ledges 24 and 25 prevent the sleeves from falling off the separator. A guard 29 of corrugated paper is placed about each projection 31 of the motor 27, see Fig. 2. He then places a second separator over the sleeves so that the bottom peripheral ledges of the second separator will telescopically engage the upper portion of the outer walls of several sleeves positioned on the first mentioned separator. The lower surface of the separator will rest on the sleeves and bear against the guards 29. The guards prevent the dynamo-electric machines from moving upwardly during transportation, due to jolts and the like. Further separators, articles and sleeves are then placed into position and similarly loaded until the required number of articles are packed to form the crate 20. In stacking the separators the articles are arranged on the separators so that the end receiving the greatest number of articles be placed above that end of the preceding separator supporting the least number of articles thereon. This arrangement is preferable as the weight of the crate will be distributed more equally. The last separator placed forms the top of the crate.

When the last separator is in position several metal ribbons or bands 33 are wrapped around the base and the separators and drawn until all of the separators are drawn tightly together. The band ends are then tied together causing the sleeves to be rigidly and securely held in position.

The feet 22 are provided on the base 21 so as to permit a dolly or lifting truck to be placed beneath the crate in order that the crate be easily handled when moving the crate from the loading room to a transportation vehicle.

These crates may be so proportioned in size that a certain number of crates will fit into a freight car and to permit several of the crates to be tied together as a unit, as shown in Figs. 6 and 7. By tying several of the crates together undue shifting of the crates in the freight car during transportation is eliminated.

One advantage of the present invention resides in the saving in cost of making special boxes for each dynamo-electric machine having an irregular outline.

Another advantage resides in the use of strong light materials that are cheap, thus the cost of packing material in forming the crate is reduced to a minimum. Further the cost is reduced for the reason that this type of shipping crate when unloaded from the freight car and emptied can be packed in a compact form, loaded into the freight car and returned to the point of shipping thereby permitting repeated use of these crates.

Another advantage resides in the saving in the cost of handling for these dynamo-electric machines in that the machines can be packed onto the separators from the production lines and the separator can be immediately secured in place to form a crate ready for shipment. Heretofore it was the practice to place each machine in a separate carton and sealed and then stacked on skids for handling from the production lines to stock and then packed for shipping. However this extra handling, if undue care wasn't used, caused some of the cartons, with the articles therein, to fall from the skid. In many instances the cartons and the articles were damaged as there was no sure means of securing them on the skid. Further, by using this type of crate, the cost of handling by the customer is also reduced to a minimum.

Another advantage of the type of crate resides in the fact that it eliminates errors in count, both in production and shipping as each crate may be made up to contain a definite number of articles.

A still further advantage resides in the fact that it substantially eliminates loss and damage claims.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a shipping crate, the combination with a plurality of separators each having a flat sheet of rigid material bounded on its edges with raised portions on opposite sides thereof; a plurality of individual tubular members formed from sheet stiff paper for enclosing articles of manufacture, said tubular members being assembled with an open end resting on a separator within the raised portions and the opposite open end of each tubular member supporting another separator by engaging the under surface of a separator within the respective raised portions; and means for clamping the separators and the tubular members in a rigid relation for shipment.

2. In a shipping crate, the combination with a plurality of separators each having a flat member made of multiply sheets of strong material and bounded on its edges with projecting elements on opposite sides thereof; a plurality of individual tubular members of corrugated paper for enclosing an article of manufacture, said tubular members being assembled with an open end resting on the upper side of a separator within the projecting elements and the opposite open end of each tubular member supporting another separator by engaging the under surface of a separator within the respective projecting elements, a support adapted to have the separators placed thereon in stacked relation; and means for clamping the separators against the tubular members and for rigidly holding the separators on the support whereby the tubular members are prevented from moving axially and/or endwise with respect to the separators.

3. In a shipping crate, the combination with a plurality of separators each having a flat sheet of rigid material bounded on its edges with raised portions on opposite sides thereof; a plurality of individual tubular members formed from normally flat sheets of strong fibrous material having flexible qualities for enclosing articles of manufacture, said tubular members being assembled with an open end resting on a separator within the raised portions and the opposite end of each tubular member supporting another separator by engaging the under surface of a separator within the respective raised portions; and means for clamping the separators and the tubular members in a rigid relation for shipment.

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