Nov. 15, 1949 F. J. BICKHAM 2,488,368

PACKING CASE

Filed Sept. 26, 1944 3 Sheets-Sheet 1

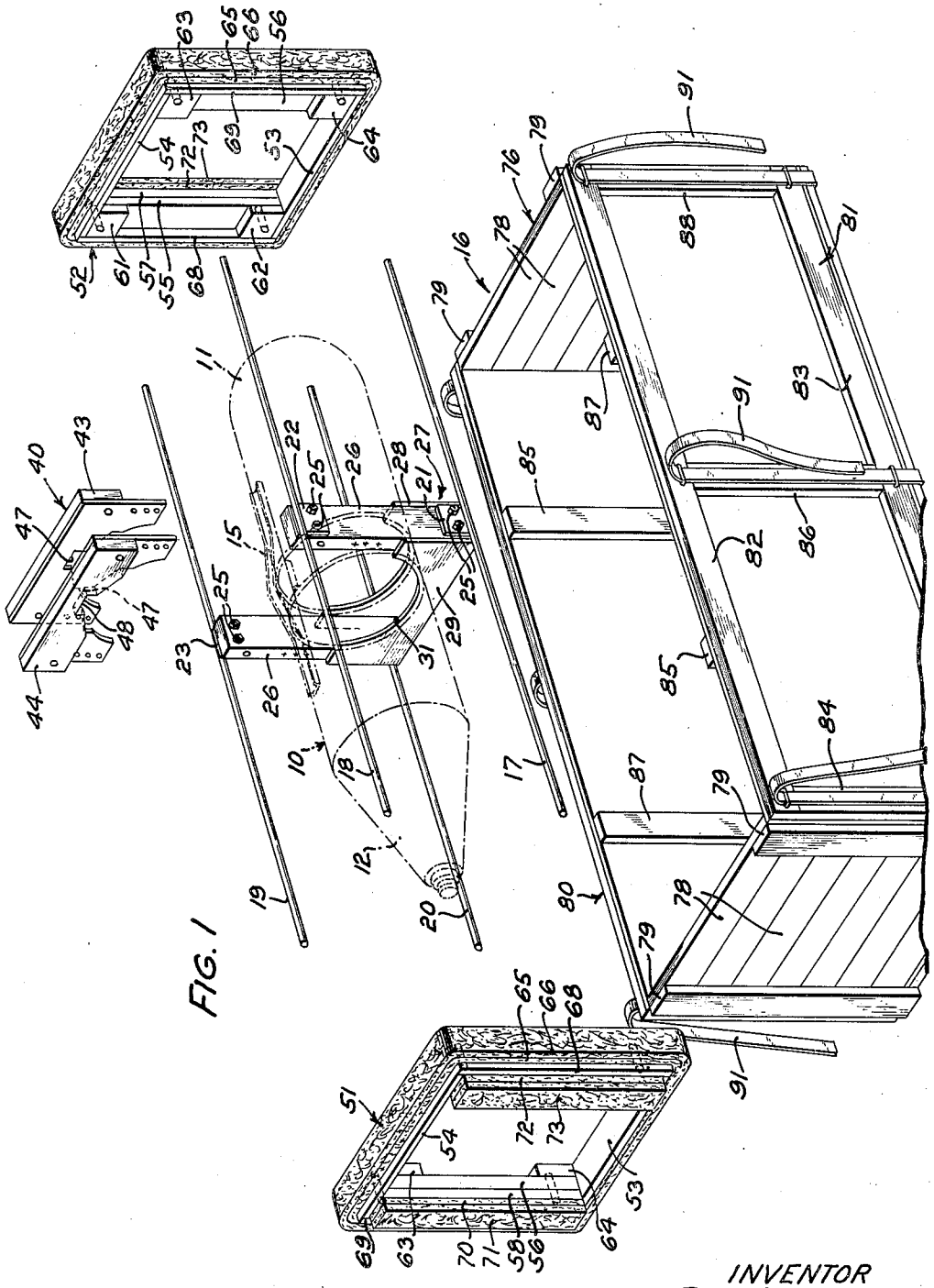


FIG. 1

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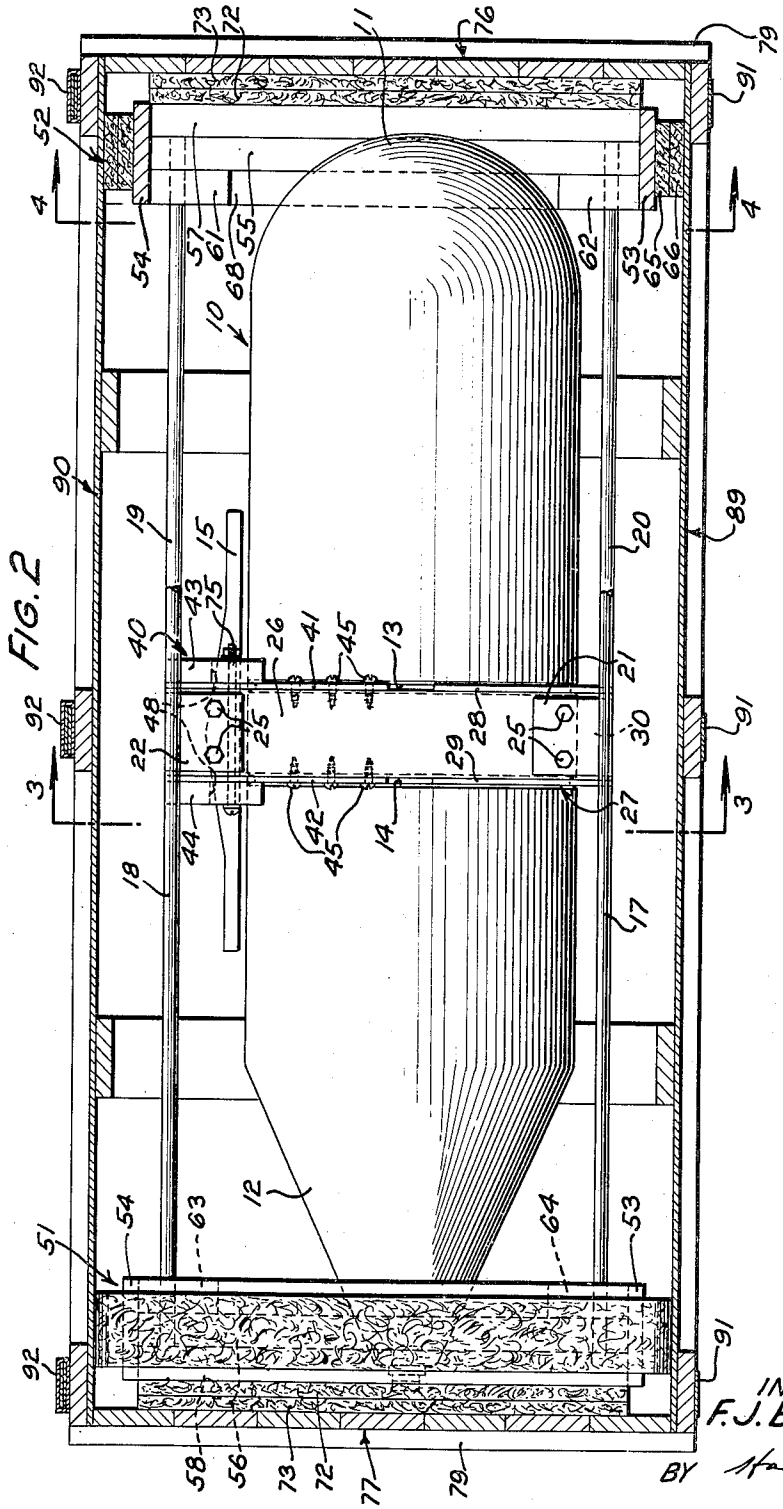


FIG. 2

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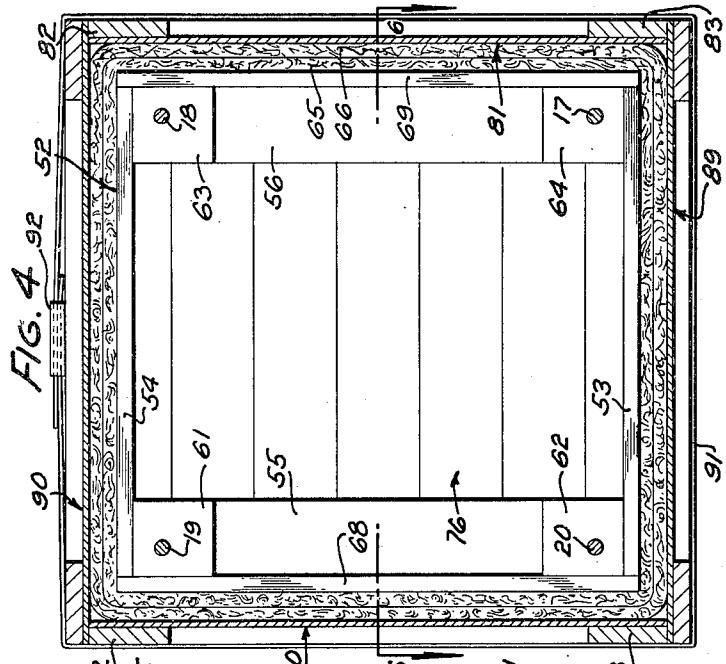


FIG. 4

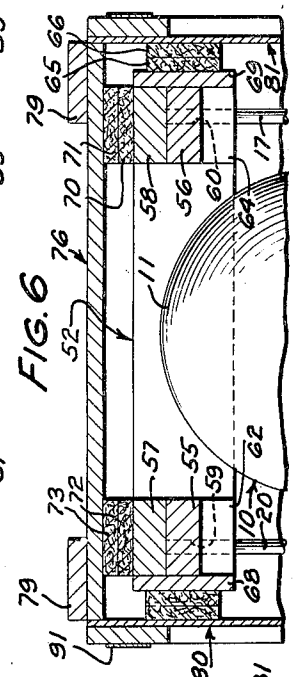


FIG. 6

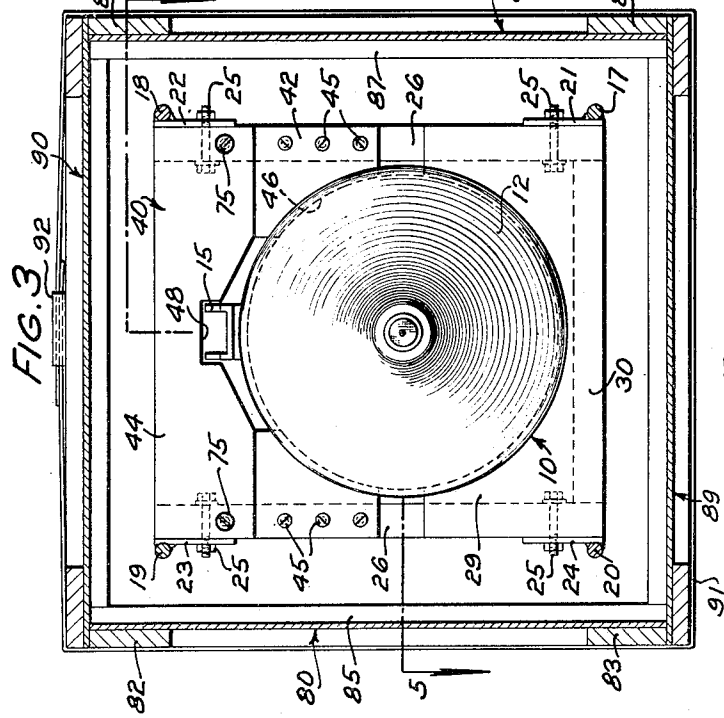


FIG. 3

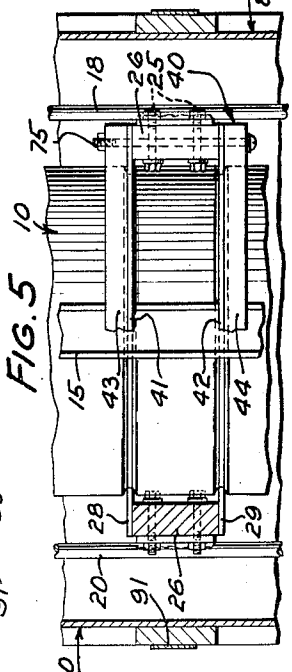


FIG. 5

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UNITED STATES PATENT OFFICE

2,488,368

PACKING CASE

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1 Claim. (Cl. 217—52)

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This invention relates to packing cases and more particularly to a packing case for electrical units.

In the transportation of some electrical units, particularly bomb-shaped units, considerable difficulty has been experienced in packing the units so that they will not be damaged in transit. These units are adapted to be mounted on the under side of the wing of an airplane by means of a bracket attached to the central portion of the unit, which is made in the shape of a bomb, and the construction of which is as light as possible due to the fact that it is airborne equipment.

It is an object of the present invention to devise a container or packing case for delicate apparatus which will be sturdy in construction and which will provide adequate support for the apparatus to prevent damage to the apparatus during its transportation.

In accordance with one embodiment of the invention, a plurality of relatively resilient rods have brackets fixed to them adjacent to their mid-portion to engage the apparatus to be transported. The ends of the rods are then inserted in blocks attached to end frames, which serve to position the rods, and the end frames have felt or other suitable semi-resilient material applied all around their periphery and on the end surface thereof, opposite to the surface into which the rods extend so that the frames will be resiliently supported within a packing case formed to such dimensions that it will tightly engage the felt when the frames with the unit supported on the rods is placed in the case.

A complete understanding of the invention may be had by reference to the following detailed description of one embodiment thereof, when considered in conjunction with the accompanying drawings, wherein

Fig. 1 is an exploded view in perspective of a packing case embodying the present invention, the top of the packing case being omitted and the electrical unit to be packed therein being shown in dot and dash lines;

Fig. 2 is a longitudinal vertical sectional view taken through the packing case adjacent the forward edge thereof, showing the unit in place in the case;

Fig. 3 is a transverse vertical sectional view taken substantially along the line 3—3 of Fig. 2 in the direction of the arrows;

Fig. 4 is a transverse vertical sectional view taken substantially along the line 4—4 of Fig. 2 in the direction of the arrows showing one of the rod supporting blocks in elevation;

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Fig. 5 is a fragmentary irregular plan sectional view taken substantially along the line 5—5 of Fig. 3 in the direction of the arrows; and

Fig. 6 is a fragmentary plan sectional view taken substantially along the line 6—6 of Fig. 4 in the direction of the arrows.

Referring to the drawings, particular reference first being had to Figs. 1 and 2, it will be seen that the apparatus to be carried in the packing case comprises an elongated bomb-shaped casing 10 having a rounded nose portion 11 and a tapering tail section 12. The casing 10 is of circular cross section and is provided with a pair of circumferentially extending grooves 13 and 14, adjacent to its mid-portion, and, in addition, the casing carries a supporting bracket 15 by means of which it may be attached to the under side of the wing of an airplane. The bracket 15 is mounted on the upper surface of the casing 10 and extends an appreciable distance longitudinally of the casing.

In order to properly support the apparatus within a suitable packing box, as designated generally by the numeral 16 of Fig. 1, a framework is provided comprising four metallic rods 17, 18, 19 and 20 to which plates 21, 22, 23 and 24 are secured in any suitable manner, for example, by welding. The plates 21, 22, 23 and 24 are each provided with suitable apertures adapted to receive bolts of nut and bolt assemblies 25—25, two bolt holes being provided in each of the plates 21, 22, 23 and 24. The bolts are adapted to pass through the apertures in the plates and to extend through wooden posts 26—26 which form parts of a wooden support assembly or framework designated generally by the numeral 27. The wooden support assembly 27 comprises, in addition to the posts 26, a pair of plywood members 28 and 29 which are suitably attached to the posts 26 and to a cross brace 30. The plywood members 28 and 29 are cut out as shown at 31, Figs. 1 and 3 so that they will nest in and engage the side walls and the inner wall of the grooves 13 and 14.

Co-operating with wooden support assembly 27 is an upper support assembly, or framework 40 also formed of pieces of wood. The upper support assembly 40 is adapted to be placed in position after the apparatus enclosed in the casing 10 has been placed in position on the wooden support assembly 27 and this upper support assembly 40 comprises a pair of plywood members 41 and 42 and a pair of braces 43 and 44. The plywood members 41 and 42 are adapted to be attached to the side surface of the wooden posts 26 in any

suitable manner, for example, by means of screws 45. The plywood members 41 and 42 are cut, as shown at 46, to provide surfaces engaging in the grooves 13 and 14 and, in addition, the plywood pieces 41 and 42 have notches 47 at their upper ends to receive the bracket 15.

The braces 43 and 44 are provided with notches 48 in alignment with the notches 47 in the plywood pieces for further supporting the bracket 15 to hold it in proper position and prevent rotation of the casing 10 with respect to the wooden support assembly 27 and the upper support assembly 40.

The ends of the rods 17, 18, 19 and 20 are inserted in two similarly formed end frames 51 and 52, which are of the same construction. The end frame 52 comprises upper and lower wooden cross members 54 and 53, which normally extend in horizontal planes and to which there are suitably attached wooden, vertically extending members 55 and 56 extending from the cross member 53 to the cross member 54 and having superposed on them similar vertically extending members 57 and 58 (see Figs. 4 and 6). The members 55 and 56 are of the same size as the members 57 and 58, and the members 55 and 56 have apertures 59 and 60 formed in them for receiving the ends of the rods 19 and 20 and 17 and 18, respectively. Attached to the upper and lower ends of the vertically extending members 55 and 56 are blocks 61, 62, 63 and 64 having apertures in them in alignment with apertures in the vertically extending members 55 and 56, through which the rods 19 and 20, 18 and 16 extend, respectively, to further rigidly support the ends of the rods with respect to the end frames 51 and 52.

Each of the end frames 51 and 52 has two layers of felt 65 and 66 wrapped around it in engagement with the outer surface of the cross members 53 and 54 and the outer surface of vertically extending boards 68 and 69 suitably attached to the side edges of the vertically extending members 55 and 57 and 56 and 58, respectively. In addition to the layers 65 and 66 of felt wrapped around the end frames, two strips of felt 70 and 71 are mounted on the exposed or outer surface of the vertically extending member 58 and two similar strips of felt 72 and 73 are attached to the exposed or outer surface of the vertically extending member 57.

In packing an electrical unit in the packing case, the unit is first nested in the wooden support assembly 27 and then the support assembly 40 is engaged with the casing 10 of the unit and then bolted in place by means of bolts 75—75 which extend through the braces 43 and 44, the plywood members 41 and 42, and the wooden posts 26. After the unit has thus been attached to the framework, including the rods 17, 18, 19 and 20, the end frames 51 and 52 may be assembled on the rods by engaging the rods in the apertures in the blocks 61, 62, 63 and 64 and the apertures in the vertically extending members 55 and 56 with the rods abutting the vertically extending members 57 and 58. The thus supported unit, peripherally engaged with the plywood members 28 and 29 and 41 and 42 of the diametrically opposite frameworks 27 and 40, respectively, may be placed in the packing box 16, which may be of any suitable construction and has been shown as comprising end portions 76 and 77 of similar construction comprised of boards 78—78 attached by means of tie strips 79—79. The side members of the packing box, designated generally by the numerals 80 and 81, are of similar construction and each comprises upper and lower horizontally extending members 82 and 83, and vertically extending members 84, 85, 86, 87 and 88, which may be fixed to the end positions 76 and 77 in any suitable manner. The bottom of the packing box 89 and the top 90 are of the same construction as the side members 80 and 81 and may be attached to the end frames and side members in any suitable manner. After a unit has been mounted in the box, the box may be tied together by suitable metallic tie strips 91—91, as is usual in such packing practice, connecting members 92 being provided for attaching the ends of the strips 91 together.

In packing units in the packing case, the bottom, sides and end members of the packing box, with the strips attached to them, are first assembled and then the support assembly, comprising the end frames 51 and 52 and the support rods 17, 18, 19 and 20, having the unit carried or suspended on them, may be slipped into the packing box.

What is claimed is:

A packing case for delicate apparatus comprising, a box structure, end frames positioned in said box structure, layers of cushioning material interposed between the end frames and adjacent portions of the box structure, a plurality of resilient rods supported at their ends by said end frames and extending parallel one to another longitudinally of the box structure, a plate attached to each of said rods, and article engaging frameworks fixed to said plates, said plates being fixed to said rods adjacent their mid-portion only.

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