

Nov. 2, 1943.

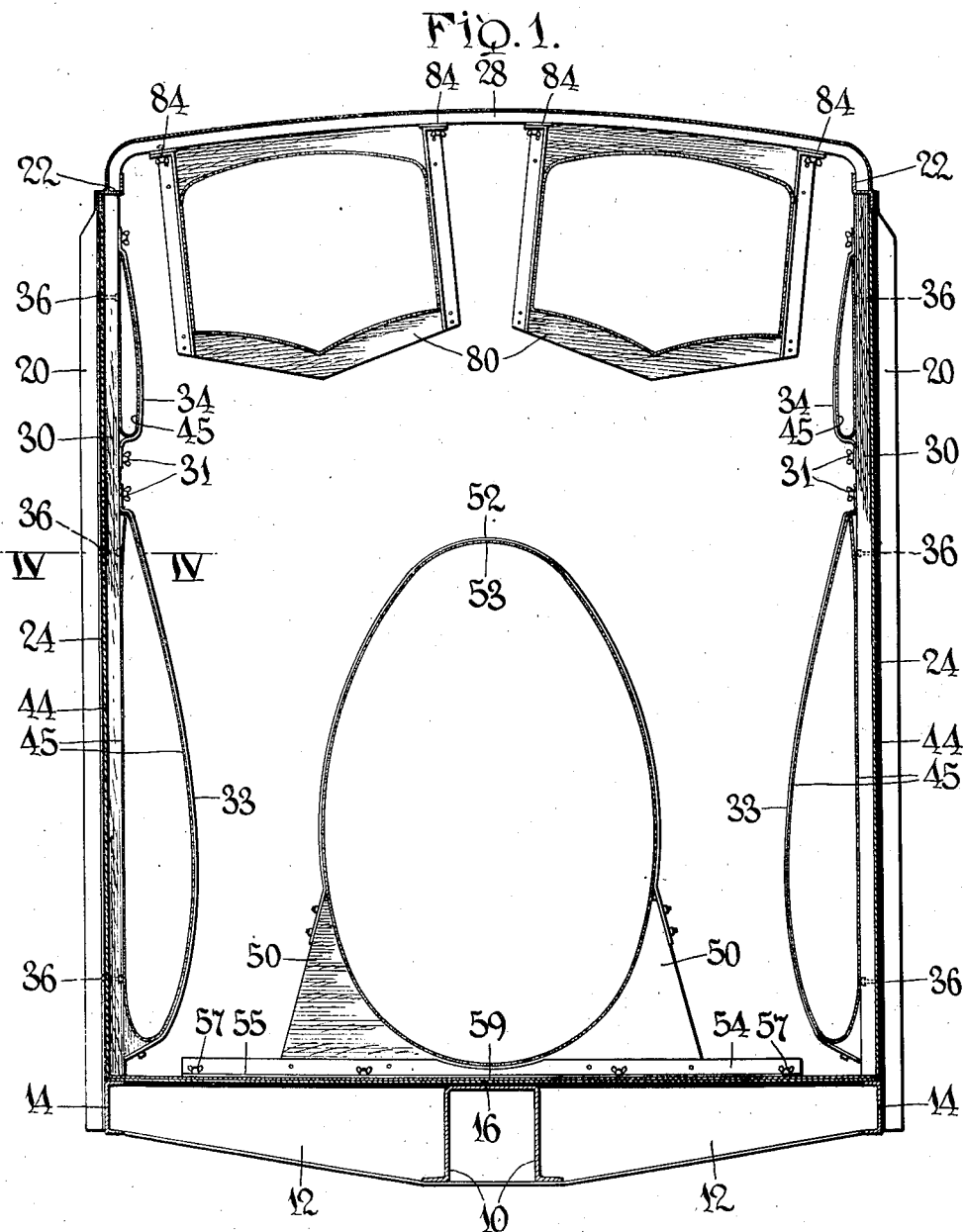
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2,333,441

METHOD AND MEANS FOR MOUNTING AIRCRAFT PARTS FOR TRANSPORTATION

Filed March 25, 1941

2 Sheets-Sheet 1



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UNITED STATES PATENT OFFICE

2,333,441

METHOD AND MEANS FOR MOUNTING AIR-
CRAFT PARTS FOR TRANSPORTATIONEarle W. Rearwin, Buffalo, N. Y., and Harold J.
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Application March 25, 1941, Serial No. 385,090

3 Claims. (Cl. 105—367)

This invention relates to methods and means for mounting aircraft parts or the like in railroad cars or motor vans or similar carriers in connection with the transportation thereof to the point of final assembly of the aircraft.

One of the objects of the invention is to provide an improved and simplified method and means for the above purpose which is adapted to safeguard the parts being carried against damage, in an improved manner. Another object of the invention is to provide an improved method and means for handling parts for the purpose described which will reduce the amounts of labor and expense involved in preparation for such transportation. Other objects and advantages of the invention will appear from the specification hereinafter.

In the drawings

Fig. 1 is a vertical transverse section through a railroad box car showing fixture devices of the invention mounted therewithin;

Fig. 2 is a fragmentary elevation of an inner side wall portion of the car of Fig. 1, showing mounting portions of a fixture of the invention attached thereto;

Fig. 3 is a fragmentary plan of the car floor structure of Fig. 1; and

Fig. 4 is a section taken substantially along the line 4—4 of Fig. 1.

The drawing illustrates the invention in conjunction with a carrier of the railroad box car type, as illustrated in Fig. 1. The car structure includes the usual center sill 10 to which are mounted transverse diaphragms 12 to furnish the base of the car body. Side rails 14 extend longitudinally of the car at opposite sides thereof and are connected to the corresponding outer ends of the diaphragms 12 to provide an integral frame. A sheet metal floor 16 is laid upon the base frame to complete the primary floor structure.

Vertical posts 20 are attached at their lower ends to the side rails 14 so as to extend vertically to provide the side wall frames in conjunction with top rails 22. Sheet metal liners 24 are attached directly to the posts 20, as by welding at 25 (Fig. 4). The roof of the car is based upon a frame structure including transverse rafters 28 which tie at their opposite ends to the top rails 22.

The aircraft mounting fixtures of the invention are illustrated in the drawings in several forms for mounting various parts of airplanes. For example, one form of the fixture of the invention is illustrated as being mounted against the side walls of the car of Fig. 1, and in this case the mounting devices each include a series of vertically disposed runners 30 to which airplane wing or fin parts are to be clamped. The runners 30 are arranged in parallel and at spaced

intervals longitudinally of the car (Fig. 2), and are provided with detachable connection devices 31 for holding flexible strap devices as at 33 and 34 so that there are thus provided suitable spaces for accommodating airplane wing or fin structures in clamped relation therebetween.

The runners 30 are arranged to be detachably hung against the side walls of the car by means of bolts 36 which are arranged to extend in connecting relation through the runners 30 and through the car side wall structure. For this purpose the wall sheathing 24 is provided with bayonet-type apertures as illustrated at 40 (Fig. 2), and it is preferred that the extending slotted portions of the apertures 40 be disposed downwardly and obliquely in alternating opposite directions, as illustrated in Fig. 2. Thus, means are provided whereby the runners 30 may be mounted upon the car side walls by initial insertion of the heads of the bolts 36 through the enlarged rounded portions of the corresponding apertures 40, and then the runner may be moved downwardly so that the shanks of the bolts pass into the slotted portions of the apertures 40 whereby the heads of the bolts are locked behind the wall sheathing 24. For this purpose the openings 41 in the runners 30 which accommodate the bolts 36 are elongated laterally (Fig. 2) to permit alternate bolts of each vertical row thereof to move sidewise in opposite directions relative to the runners 30 as the bolts move into the slotted portions of the wall apertures 40. Thus, upon tightening of the bolt nuts the runners 30 are clamped to the side wall of the car in an improved manner whereby it is impossible for the runners to become accidentally displaced upwardly in such manner that the bolts 36 become disengaged from behind the slotted portions of the apertures 40. Preferably, a liner 44 of wood or other non-metallic material is disposed between the metal sheathing 24 of the car wall and the runners 30 so as to insulate the fixtures from the car walls against transmission of condensed moisture and/or static electrical charges into the airplane parts which are supported by the fixtures.

Cushioning and insulating liners 45 of felt or other suitable resilient material are arranged upon the runner and strap parts for bearing against the aircraft parts when mounted there-within so as to forestall frictional wearing or other damage to the aircraft parts during transit. Also, the straps 33 and 34 are preferably covered with rubber or other suitable resilient material to further cushion their clamping action upon the mounted aircraft parts.

As illustrated at the lower central portion of Fig. 1, a fixture of the invention is provided for mounting an airplane fuselage or similar part for transit, and this fixture comprises a series

of transverse runners 50 which correspond to the runners 30 for holding the wing parts against the side wall. The runners 50 are similarly provided with strap and liner devices 52-53 which are arranged to detachably mount the airplane fuselage thereon. Each runner 50 is provided with a base plate 54 having a horizontally extending flange 55 adapted to be clamped to the car floor by means of bolts 57, as in the manner of the mounting of the runners 30 upon the car side walls. For this purpose the floor 16 is perforated as at 58 (Fig. 3) with bayonet-type openings to provide the mounting and dismounting operations as explained hereinabove. Also, a wooden or other non-metallic material liner 59 is preferably employed between the car floor 16 and the mounting runners so as to insulate the fixture against transmission of static electricity and/or condensed moisture from the car floor.

As illustrated in the upper portion of Fig. 1, fixtures for supporting airplane pontoons or the like may be suspended from the car ceiling, and in this case the fixtures comprise a series of transverse frames 80 which are adapted to be mounted by means of bolts 84 to the ceiling rafters 28 as in the manner of the mounting of the previously referred to fixtures 30 and 50 to the other car parts.

It will be understood that the runner elements of the fixture devices of the invention will be selectively located longitudinally of the respective aircraft parts to be mounted for transit in accord with the structural strength and physical proportion characteristics of the respective aircraft parts. Thus, the number of brackets for mounting each aircraft part will depend upon the weight to be carried, and the relative spacing of the brackets will depend in each case upon the strength and structural form of the part being mounted. It will also be understood that the arrangement for mounting the heads of the bracket bolts 36 within the confines of the vertical posts of the carrier provide protection for the bolt heads against damage from externally of the carrier, such as would otherwise interfere with subsequent smooth mounting and dismounting operations. Also, the apertures through the carrier wall sheathing are guarded against infiltration of dust or the like by reason of being covered by the vertical post members.

It will be understood that the method and means of the invention makes available improved arrangements for distribution of the aircraft parts to be transported within the interior of the carrier. For example, the relatively flat aircraft parts may be mounted, as illustrated, against flat side wall portions of the carrier while other more bulky aircraft parts may be mounted within the center portion and in suspended relation from the roof. Thus, the aircraft parts may be readily kept apart so as to prevent damaging interferences therebetween, and the space within the carrier may be utilized to best advantage. Also, the aircraft parts are separately available for mounting and removal from the carrier, and in connection with the removal thereof no distorting or other strains need be imposed upon the aircraft parts because it is not necessary to pry loose nailed down crate parts or the like, as in the case of certain prior art methods.

Although only a limited number of forms of the fixture devices of the invention have been

shown and described in detail, it is to be understood that the inventive principles herein involved are applicable to other forms of the invention without departing from the spirit and scope defined in the following claims.

We claim:

1. In combination, a transportation fixture for aircraft parts and a plate member adapted to extend as an inner wall portion of a housing carrier, said fixture including spaced runners disposed vertically for detachable mounting thereon of an aircraft part to be transported, said runners having laterally extending connection devices with enlarged end portions adapted to slip-fit through corresponding openings in said plate member, said plate member having reduced slotted portions extending obliquely in alternately opposite directions downwardly below each of said openings and in open communication therewith, whereby said runners may be shifted downwardly subsequent to slip-fitting of said enlarged heads through said openings into detachably locked relation upon said plate.

2. In combination, a transportation fixture for aircraft parts and a plate member adapted to extend as an inner wall portion of a housing carrier by being mounted upon vertical post framing members having recesses in the faces thereof contiguous to said plate, said fixture including spaced runners disposed vertically for detachable mounting thereon of an aircraft part to be transported, said runners having laterally extending connection devices with enlarged end portions adapted to slip-fit through corresponding openings in said plate member in portions thereof backed up by said recessed post members, said plate member having reduced slotted portions extending obliquely in alternately opposite directions downwardly below each of said openings and in open communication therewith, whereby said runners may be shifted downwardly subsequent to slip-fitting of said enlarged heads through said openings into detachably locked relation upon said plate.

3. In combination, a transportation fixture for aircraft parts and a plate member adapted to extend as an inner wall portion of a housing carrier by being mounted upon vertical post framing members having recesses in the faces thereof contiguous to said plate, said fixture including spaced runners disposed vertically for detachable mounting thereon of an aircraft part to be transported, said runners having laterally extending connection devices with enlarged end portions adapted to slip-fit through corresponding openings in said plate member in portions thereof backed up by said recessed post members, said plate member having reduced slotted portions extending obliquely in alternately opposite directions downwardly below each of said openings and in open communication therewith, whereby said runners may be shifted downwardly subsequent to slip-fitting of said enlarged heads through said openings into detachably locked relation upon said plate, and a dielectric sheet member disposed across the interior surface of said plate member to shield the same from the aircraft parts against static electrical discharge therebetween.

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