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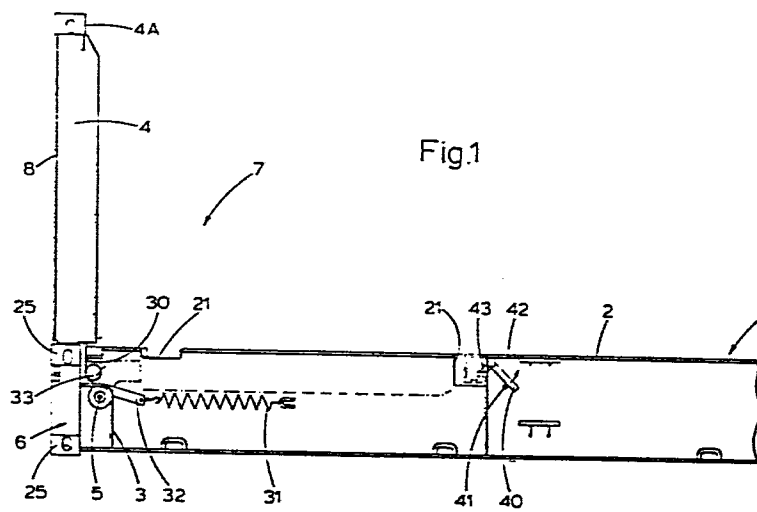
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(54) Folding freight carriers.

(57) A folding freight container has a base (1) with an upper loading surface (2) and a pivotally mounted post (4) located at each corner. The posts are movable between an erect upright position and a folded down position in which each post lies parallel to the base. Two of the corner posts located at one end of the base are interconnected by a panel (8) which may be planar or corrugated, and in the folded down position of the end structure form a substantially continuous surface with the base loading surface (2).

The posts are preferably mounted on a flange (3) extending from an auxiliary post (6) located at each corner of the base and not projecting above the loading surface (2) of the base. The pivotal mounting (5) for the end structure is detachable to allow removal of the same. Cross-ribs (9,10) and strengthening ribs are provided to strengthen the support for the panel (8). Conveniently, a locking device (40,41,43) is provided on the base for locking the end structures in their folded down position.



FOLDING FREIGHT CARRIERS

This invention relates to folding freight carriers or containers of the type usually known as cargo flats.

This type of cargo flat as disclosed in European Published Specification 30074 comprises a substantially flat rectangular base structure which forms a load-bearing freight carrying platform. A post member is provided at each corner thereof and is pivotally mounted on the base structure such that each post member is movable between a folded position in which the post rests upon and lies parallel to the base structure, and an erected position in which the post extends upwardly from the base structure.

One or more cross members can be connected between the posts to form side and end members of the carrier and in some carriers, the two posts at each end of the base structure are permanently interconnected by one or more members to a unitary end structure. The carrier forms an enclosure or container for freight or cargo which is loaded on to the upper surface of the base structure when the end structure and side members are in an erected position.

With the corner posts in their folded position, one or more carriers can be stacked one upon another to save space when empty carriers are transported together. The stacked cargo flats have locking devices, such as twistlocks, which co-operate with ISO castings for example located on the pivotable posts for interconnecting one folded cargo flat to a similar adjacent folded cargo flat which is stacked thereon.

It is necessary that a stack of folded cargo flats does not extend beyond the overall height of an erected flat so as to conform to and fall within the space allocated on transporting vehicles for transporting such cargo flats. Therefore to stack a maximum number of folded cargo flats the flats must fold down to the minimum possible height and this has been achieved by ensuring that in its folded position each post lies substantially parallel to the base and does not project above the upper surface of the base structure.

Conveniently grooves or recesses are provided in the upper surface of the base structure for receiving the cross members of the end structures, and the posts.

There is often the need with certain types of freight to provide a substantially plain load carrying platform. Accordingly, the recesses in the upper surface of the base structure receive the posts and cross members so that these parts lie flush with the upper surface of the base structure. However, with the end structures in their folded position gaps between the cross-member posts and base structure act as a hazard for operators who walk on the base structure and can hamper loading of freight upon the base structure when freight catches in the gaps or against the posts and crossmembers when these do not fit correctly.

Plain load carrying platforms can also be provided by removing the end structures from the base structure but in known cargo flats this results in the cargo flats having then to be moved by non-conventional lifting equipment since the devices, ISO castings, made available on the end structures are removed with the end structures. Furthermore, when the end structures are mounted upright on a loaded base structure the posts and cross members do not retain cargo.

It is desirable therefore to provide a cargo flat in which such disadvantages are substantially removed.

According to the present invention there is provided a folding freight carrier including a base structure having an upper load bearing freight carrying surface, a post pivotally mounted at each corner for movement between an erect upright position and a folded down position in which each post lies substantially parallel to the base structure, frame members interconnecting the two posts at each end of the base structure to define an end structure at each of two opposed sides of the base structure, and a panel mounted on each end structure for defining outer surfaces on the end structures so that when the end structures are in their folded down position the panels define a substantially continuous planar surface with the upper surface of the base structure.

In one embodiment of a freight carrier according to the present invention each post is pivotally mounted on an auxiliary fixed post located at respective ones of the corners of the freight carrier. The auxiliary posts are of a height which does not project above the level of the upper surface of the base structure. Preferably, a locking

device is provided at the top and bottom of the auxiliary corner post, and this locking device can take the form of a conventional twistlock device mounted in an ISO corner casting.

Conveniently, a flange projects from each auxiliary post in the longitudinal direction of the cargo flat on to which flange one of the posts is mounted for pivotal movement about a pivot pin. The pivot pin is preferably detachable so that the posts and end structures can be detached from the base structure when required by an operator.

Such a construction advantageously meets the needs of some operators who do not wish to utilize the fold-down feature of the end structures of the cargo flats but require the flat platform provided by the upper surface of the base structure of the cargo flat which also allows the base structures to be stacked and interlocked in the stack. The locking devices on the auxiliary posts also facilitate interconnection with lifting equipment to move the cargo flats from one location to another either with or without the end structures.

Preferably recesses are provided in the base structures for receiving therein the corner posts and frame members which support the panel. The recesses extend from each corner longitudinally of the base structure. When the posts and frame members are in the folded position the panel lies in a plane parallel to and above the upper surface of the base structure and covers the recesses in which the frame members and posts are located.

A simple panel member on the end posts might not have sufficient strength. Accordingly strengthening ribs can be provided on the inside of the panels preferably extending vertically. These can be received by shallow (usually longitudinal) recesses in the platform. It is a surprising feature that it has been found that the presence of these additional shallow recesses do not interfere with the usefulness of the platform.

The end structures are preferably provided with conventional counterbalance spring arrangements by which forces are provided to assist the movement of the end structures from their folded to their erect positions so that the heavy structures can be moved manually.

An embodiment of a cargo flat according to the invention will now be described by way of example with reference to the accompanying drawing, in which:

Figure 1 is a partial side elevational view of a cargo flat according to the present invention,

Figure 2 is a partial plan view of the cargo flat of Figure 1 with an end structure in its folded down position, and

5 Figure 3 is an elevational view of one end of the cargo flat of Figures 1 and 2.

Referring to the drawings there is illustrated a folding freight carrier or container of the type usually known as a folding cargo flat and this comprises a substantially flat rectangular base structure 1
10 having an upper freight carrying surface 2 defined by wooden planking supported on a framework which is well known in the manufacture of such cargo flats, and which has therefore not been described herein in detail.

At each end of the base structure (only one end being illustrated)
15 there is provided an end structure comprising two posts 4 each mounted for pivotal movement about a pivot pin 5 journaled in a flange 3 extending from a fixed auxiliary post 6 in the longitudinal direction of the base structure 1. Each of the posts is provided at its free end with an ISO corner casting 4A for allowing connection with lifting equipment
20 for moving the cargo flat when the end structures are in the erected position of Figure 1.

The two posts 4 located at one end 7 of the cargo flat are permanently interconnected in a frame structure, Figure 2, including cross ribs 9, 10 welded to the posts 4.

25 A flat panel 8 is mounted on an outer side of each end structure to define a planar external surface to each end structure of the cargo flat when the end structures are in the erected position as shown in Figure 1. The panel 8 extends over the posts 4 and cross-ribs 9, 10 by an amount just sufficient to enable the plate to be welded thereto.
30 Strengthening ribs 11 are mounted on the panel 8 and extend between the cross-ribs 9, 10. The strengthening ribs 11 are of a channelled cross-section and the edges thereof are welded to the panel 8 and ribs 9, 10. Each end structure is movable about the pivot pins 5 between the erected position and the folded position of Figure 2. The pivot pins 5 are
35 detachable to release the corner posts and allow the end structures to be removed so that when an operator deems it necessary he can use the cargo flat without the end structures.

End posts at the opposite end of the cargo flat 1 are also interconnected by a frame structure substantially identical to the frame structure 8.

5 A recess 20 extends from each corner longitudinally of the base structure and receives a respective one of the corner posts 4 when the end structure is in its folded or collapsed condition. Further recesses 21 are provided in the upper freight carrying surface of the base structure transverse to the longitudinal direction thereof for receiving the cross ribs 9, 10. Recesses, not shown, are also provided in the
10 carrier surface 2 and these recesses extend longitudinally of the base structure for receiving the ribs 11. These longitudinally extending grooves are shallow relative to the depth of recesses 20 and grooves 21 since the ribs 11 are of a smaller cross-sectional size than the posts 4 and cross-ribs 9, 10. Similar grooves are provided at the opposite end
15 of the base structure for receiving the rib members of the opposite end structure.

When the posts 4 and ribs 11 are located in their respective recesses the end structures including panels 8 project above the level
+h' of the upper surface of the base structure by some 6 mm and the panels 8
20 provide an even planar surface over the folded down end structures. Accordingly, the planar surfaces defined by the panels 8 extend parallel to but slightly above the upper surface of the base structure thereby providing a flat loading surface for securely and easily loading freight thereon.

25 As disclosed above the base structure of the freight carrier is provided at each corner with an auxiliary fixed post 6, the height of which does not extend beyond the depth of the base structure. At each end of each post 6 is provided an ISO corner casting 25 having apertures in the side walls thereof for use with twistlocks, for example, for
30 interlocking stacked containers, or, receiving locking devices of lifting equipment utilized to move the cargo flats from one point to another.

Each post 4 is provided at its lowermost point with a cranked arm 30 by which the post is pivotally connected to the pivot pin 5. Accordingly when the post is pivoted to the folded down position
35 substantially all the posts lie within the base structure and the posts 4 do not obstruct engagement of the lifting equipment with the ISO corner castings 25.

A spring arrangement 31 is connected via arm 32 fixed relative to the pivot pin 5 and operates in a conventionally known manner to assist in the manual movement of the end structure from the folded down to the erected position, and vice versa.

5 The end structures are lockable in both the erected and folded down positions. The locking devices for the erected position are illustrated in Figure 3. In this Figure draw bolts 33 are shown to be mounted on the base structure with the bolt located immediately inwardly of the cranked arm 30 of each post 4 to prevent pivotal movement of the
10 post. A locking tab 34 is provided to engage a cut out in the draw bolt 33 and thereby lock the draw bolt in its locking position.

 The posts 4 are lockable in their folded position with a pivotally mounted L-shaped lever 40 which is pivotable from a stop 41 towards the undersurface 42 of the of the planking defining the upper freight
15 carrying surface 2.

 In the folded down position of the end structures, illustrated in chain dotted lines in Figure 1, the free end of the shorter arm of the L-shaped lever 40 extends into an aperture in ISO corner casting 4A . When the post 4 is moved upwardly, without releasing locking lever 40, one
20 side of the aperture into which lever 40 extends engages an angled surface 43, relative to the length of the shorter arm and pivots the lever 40 against stop 41 thus preventing further upward movement of the post 4.

 To release post 4 the longer arm of the lever 40 is pivoted
25 towards the undersurface 42 of the carrier surface 2 whereupon the shorter arm moves downwardly and outwardly from the aperture in the ISO corner casting 4A . The post 4 is then movable upwardly towards the erected position.

 In an alternative cargo flat according to the invention the
30 strengthening ribs 11 can be replaced by a corrugated sheet welded between the posts 4 and cross ribs 9, 10. The panel 8 is again mounted on the end structure between posts 4 and ribs 9, 10.

 The wooden planking used for the upper freight carrying surface of the base structure can be replaced by sheet metal, such as aluminium or
35 steel.

Whilst the embodiment disclosed herein has been described as having a planar panel 8 mounted on end structures including individual strengthening ribs 11, the end structures of a cargo flat in accordance with the invention may be provided with only the planar panel 8 and no strengthening ribs. The panel serves to prevent goods loaded on the

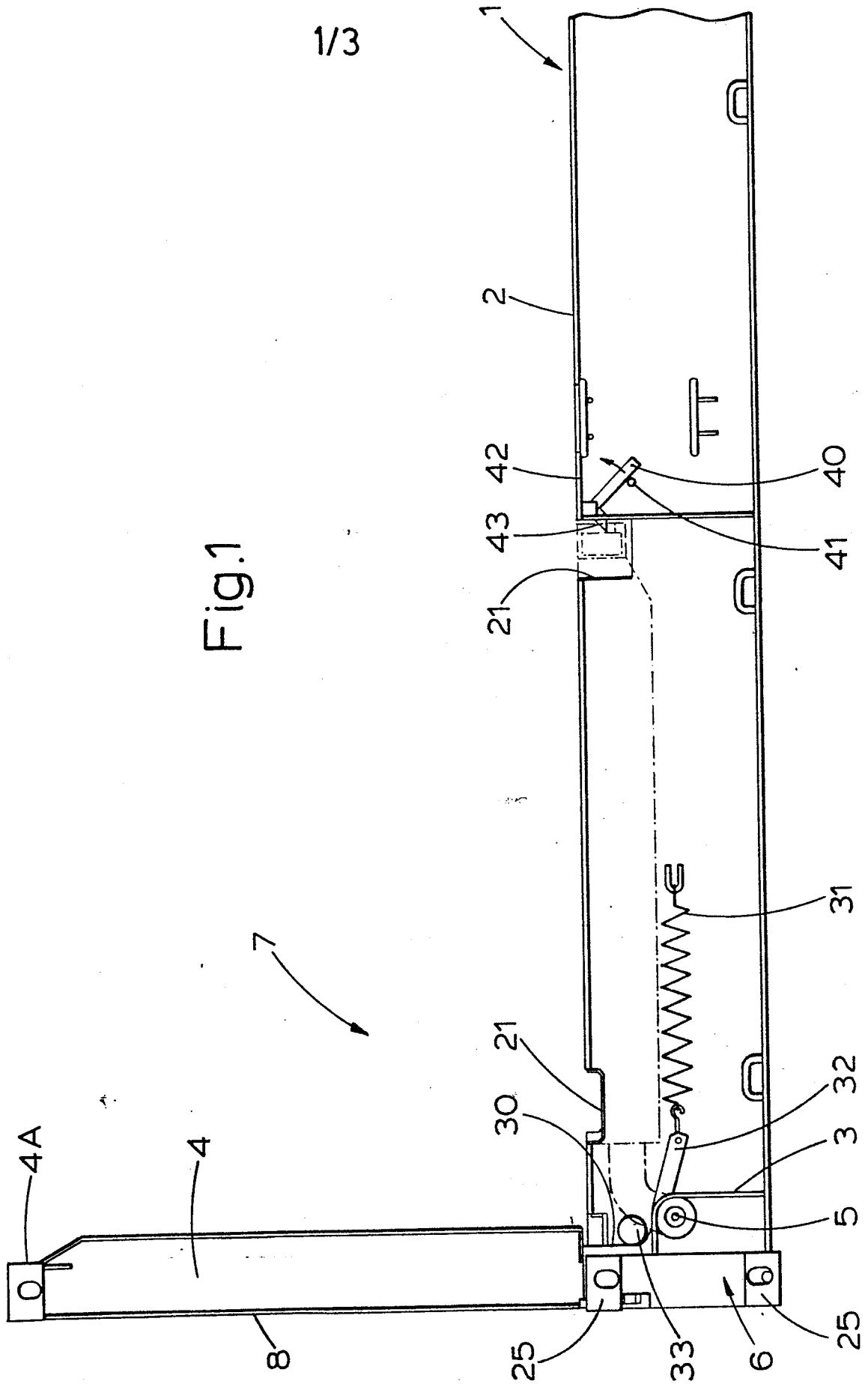
5 cargo flats from falling off through open end structures. The provision of the individual ribs or corrugated sheets provides the panel 8 with additional strength where particularly heavy goods are to be carried. The planar panel 8 may be of a single sheet or two or more sheets.

CLAIMS:

1. A folding freight carrier including a base structure (1) having an upper load bearing freight carrying surface (2), a post (4) pivotally mounted at each corner for movement between an erect upright position and
5 a folded down position in which each post lies substantially parallel to the base structure, and frame members (9,10) interconnecting the two posts at each end of the base structure to define an end structure at each of two opposed sides of the base structure, characterised in that a panel is mounted on each end structure for defining outer surfaces on
10 the end structures so that when the end structures are in their folded down position the panels define a substantially continuous surface with the upper surface of the base structure (1).
2. A carrier as claimed in claim 1, characterised in that an auxiliary fixed post (6) is located at each corner of the freight
15 carrier.
3. A carrier as claimed in claim 2, characterised in that the auxiliary fixed posts (6) do not project above the level of the upper load bearing surface (2) of the base structure (1).
4. A carrier as claimed in claim 2 or 3, characterised in that
20 locking devices (4A) are located at the top and bottom of the auxiliary posts (6), the locking devices comprising an ISO corner casting and a twistlock.
5. A carrier as claimed in any one of claims 2 to 4, characterised in a flange (3) projecting from each auxiliary post (6) and on which a
25 respective one of said corner posts (4) is pivotally mounted, the pivotal mounting (5) for said posts being detachable so that the posts and end structures are detachable from the base structure (1).
6. A carrier as claimed in any one of the preceding claims, characterised in that the base structure includes a recess extending from
30 each corner for receiving a respective one of the corner posts (4) when the end structure is in its folded down position.
7. A carrier as claimed in claim 6, characterised in further recesses (21) in the base structure for receiving cross ribs (9,10) extending between two posts (4) and strengthening ribs (11) extending between the
35 cross-ribs, the recesses for the strengthening ribs are shallower in depth than the recesses for the cross-ribs.

8. A carrier as claimed in any one of the preceding claims, characterised in locking means (40,41,43) mounted on the base structure (1) for locking the end structures in their folded down position.
9. A carrier as claimed in claims 8, characterised in that
- 5 the locking means comprises a pivotally mounted L-shaped lever (4), one arm of which is engageable in an ISO corner casting (4A) provided at the end of said corner posts (4).
10. A carrier as claimed in any one of the preceding claims, characterised in that said panel (8) is planar.
- 10 11. A carrier as claimed in any one of claims 1 to 9, characterised in that said panel (8) is a corrugated sheet.

Fig.1



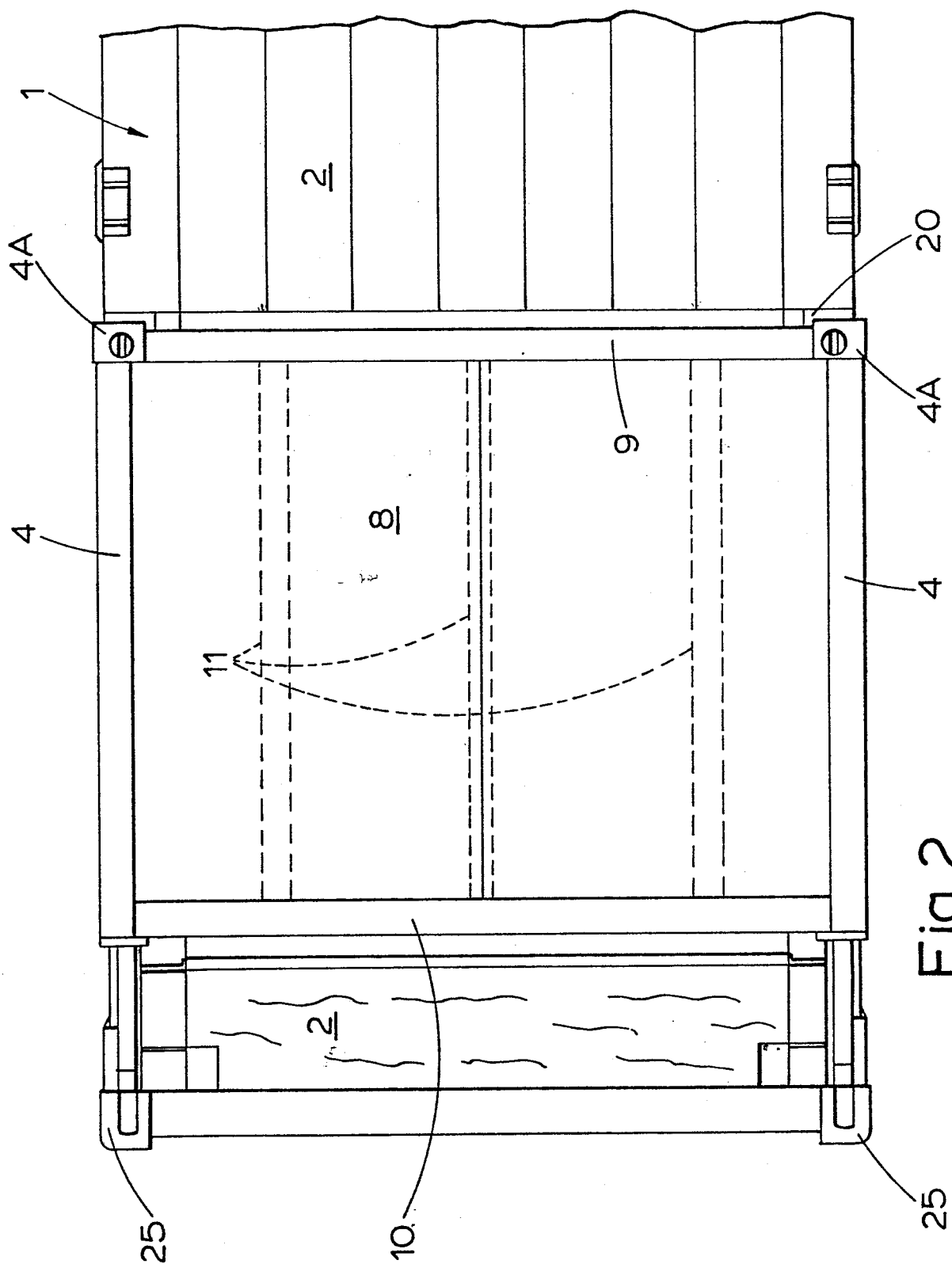


Fig. 2

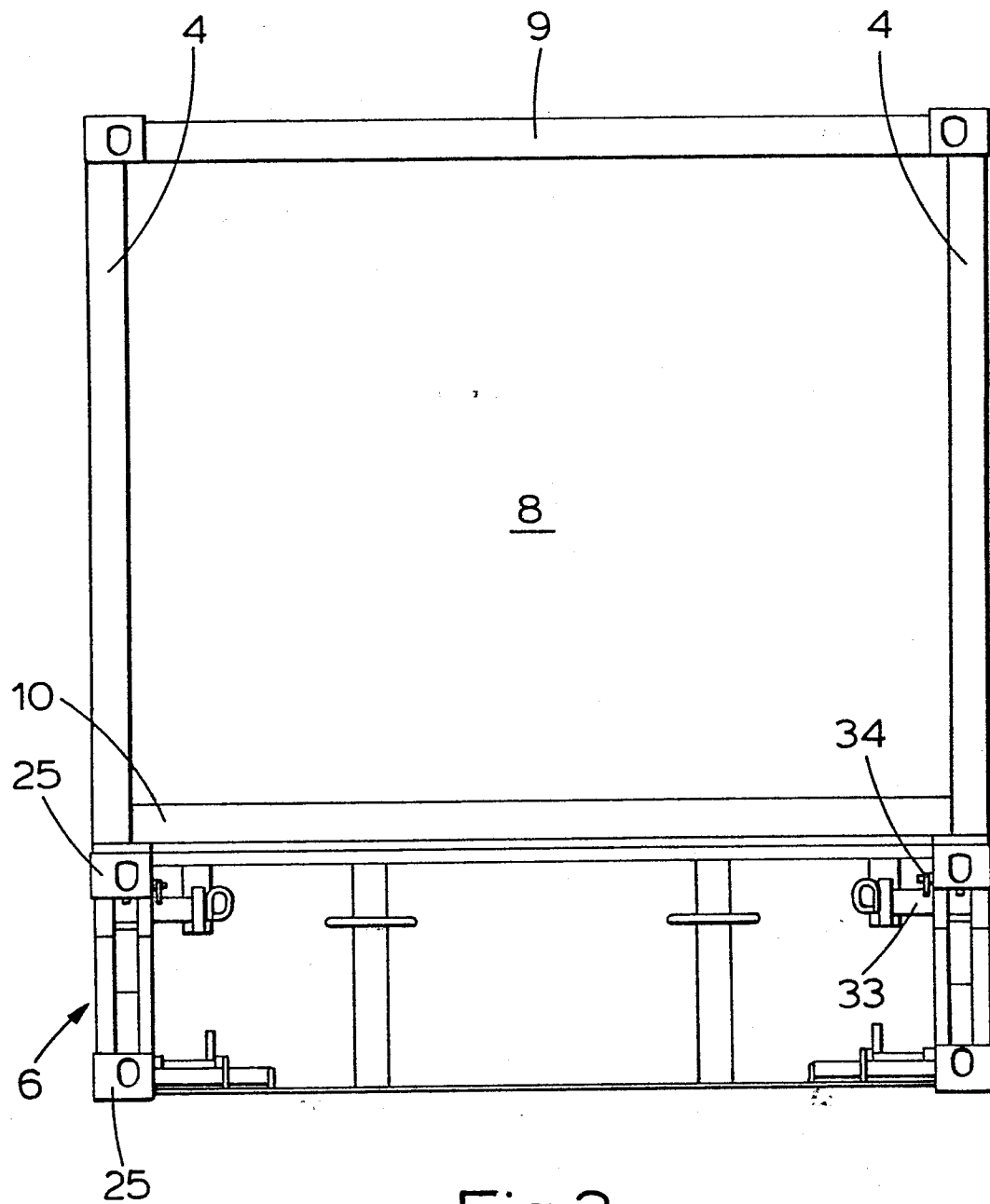


Fig.3