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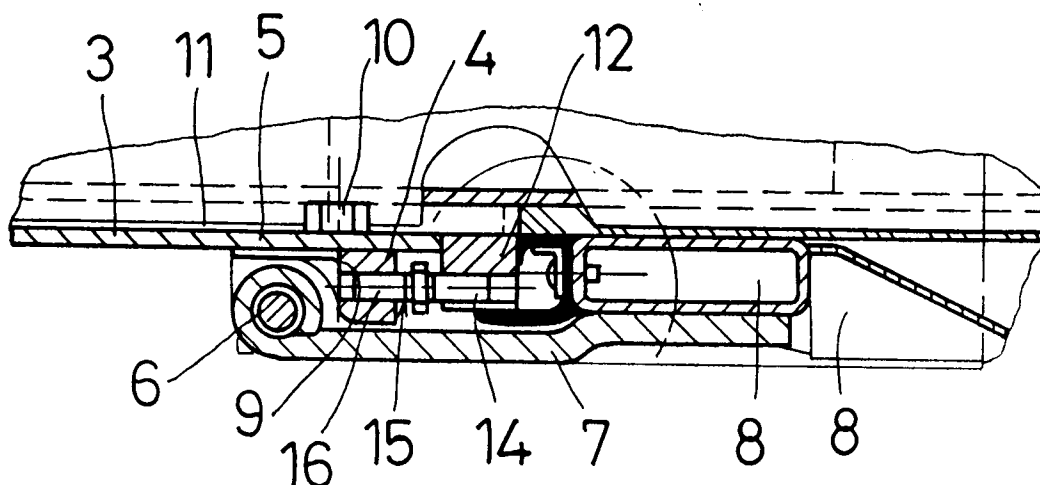
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(54) **Adjustable hinge for closures.**

(57) A hinge assembly (1) is provided which is particularly useful in hanging doors (2) on a transport or shipping container. Each hinge assembly has a base (4) releasably securable to a door frame (3) and an anchor (12) offset therefrom in a direction transverse the hinge axis (6). The anchor (12) and base (4) have aligned screw-threaded holes of opposite hand and into which extend opposite ends (14,16) of an adjuster stud (15) having complementary screw-threads thereon. The adjuster stud has formations intermediate its end whereby it may be rotated by a tool in order to adjust the lateral position of the hinge base preparatory to tightening of fasteners (10) securing it to the door frame (3).



**FIG. 2**

**THIS INVENTION** relates to an adjustable hinge for closures for apertures and, more particularly, for closures such as doors which are to align with frames for receiving same.

Still more particularly, but not exclusively, the invention is directed to adjustable hinges for heavy doors and also, double doors wherein one door is supported and hinged to another door which, in turn, is hinged to a supporting post or frame therefor. Such an arrangement may be found in side opening transport or shipping containers.

Hinges used for mounting certain types of heavy doors, such as the doors of transport containers, in particular shipping containers, are often welded to the steel structure of the container, and in particular, the surrounding frame to a door aperture. Alignment of such hinges is extremely difficult and, with distortion caused by welding, misalignment of doors with their associated frames is reasonably common place. In addition, even if a door is correctly aligned, such a system can result in stresses being present in the connections of the hinges to the supporting frames which can, in turn, ultimately give rise to broken hinges and associated problems.

It is the object of this invention to provide an adjustable hinge which will render the mounting of a door of the nature described above more easy and accurate without the danger of introducing stresses in the hinge connections to the door frame.

In accordance with the invention there is provided a hinge assembly comprising a base supporting a pivot for a hinge, said base having means for securing it by means of at least one fastener to a door frame, an associated anchor spaced apart laterally from the base and wherein the anchor is held captive relative to the door frame, the anchor and base each being provided with screw-threaded holes of opposite hand extending transversely to the axis of the pivot and each receiving one screw-threaded zone of a complementarily screw-threaded adjuster stud having a formation intermediate its ends for engagement by a tool for rotating same to adjust the relative positions of the anchor and base in a direction transverse the axis of the pivot.

Further features of the invention provide for the base to be adapted to be attached to the frame by means of bolts or cap screws extending through the frame and a back-up plate on the opposite side of the frame; for the anchor member to be secured to the periphery of the frame or inside a peripheral bead to the door frame; for the axis of the adjuster stud to extend at right angles to the axis of the hinge pivot in elevation; for the base and thus the hinge assembly to be located on the outside of the door frame; and for the hinge pivot to support a hinge member extending, in the closed condition, over the anchor and adjustment stud.

The invention still further provides a transport or shipping container, in particular a side opening container having double door assemblies, wherein the doors are hinged to the container door frame through hinge assemblies as defined above.

In order that the invention may be more fully understood one embodiment thereof will now be described with reference to the accompanying drawings.

In the drawings:-

FIG. 1 is a perspective view of a side opening transport container illustrating the two double door assemblies on one side thereof; and,

FIG. 2 is a detailed sectional plan through a hinge of the type provided by this invention and incorporated into the container door assembly illustrated in Figure 1.

In the embodiment of the invention illustrated in the drawings, adjustable hinges 1, as provided by this invention, are employed to hinge assemblies pairs of doors 2 of a transport container hinged one to the other, to a frame 3.

Turning now to Figure 2, the hinges each comprise a base 4 adapted to be clamped to a plate-like frame member 5 of the surround to the doorway. The base provides a pivot 6 for a hinge member 7 which is secured at its free end to a door 8.

The base has a plurality of screw-threaded holes 9 which receive bolts or cap screws 10 extending through the frame plate 5 and a back-up plate 11.

An anchor nut 12 is fixed to the periphery of the doorway and the nut has a left-hand threaded hole receiving a left-hand thread portion 14 of an adjustment stud 15, the other end 16 of which extends into a complementarily right hand screw-threaded hole in the base 4. The axis of the stud 15 extends, in elevation, at right angles to the axis of the pivot 6 of the hinge and thus can adjust the base in a direction towards and away from the periphery of the doorway. The central region of the stud has a hexagonal formation so that it can be rotated by means of a spanner.

In order to adjust a hinge of the type described above, the bolts or cap screws are loosened somewhat and the adjustment stud rotated until the door is properly aligned or the hinge is properly aligned with other hinges. The bolts or cap screws can then be tightened. If required, at this stage, the base could be permanently secured to the frame plate 5 by spot welds or the like.

It will be understood that an adjustable hinge of the type described above will greatly facilitate the proper alignment of doors of a heavy nature such as are found on transport containers.

Also, the exact nature of the hinge can be varied widely. For example, the anchor 12 and base 4 could be incorporated in a single unit wherein the unit is secured to a door frame. Also the manner in which the base is ultimately secured to the door frame can be varied widely.

5 The invention thus provides a simple yet effective adjustable hinge for certain types of doors or other closures as well as transport and shipping containers having doors fitted using such hinges.

## Claims

- 10 1. A hinge assembly comprising a base (4) supporting a pivot (6) for a hinge member (7), said base having means for securing it by means of at least one fastener (10) to a door frame (3), the hinge assembly being characterised in that an associated anchor (12) is spaced apart laterally from the base and wherein the anchor is held captive relative to the door frame, the anchor and base each being provided with screw-threaded holes of opposite hand extending transversely to the axis of the pivot and each receiving one  
15 screw-threaded zone (14, 16) of a complementarily screw-threaded adjuster stud (15) having a formation intermediate its ends for engagement by a tool for rotating same to adjust the relative positions of the anchor and base in a direction transverse the axis of the pivot.
- 20 2. A hinge assembly as claimed in claim 1 in which the base is adapted to be attached to the door frame by means of bolts (10) or cap screws extending through the frame and a back-up plate (11) on the opposite side of the frame.
3. A hinge assembly as claimed in either of the preceding claims in which the anchor member is secured to the periphery of the frame.
- 25 4. A hinge assembly as claimed in any one of the preceding claims in which the axis of the adjuster stud extends, in elevation, at right angles to the axis of the hinge pivot.
5. A hinge assembly as claimed in any one of the preceding claims in which the hinge member (7) extends, in the closed condition, over the anchor and adjuster stud.
- 30 6. A transport or shipping container wherein the access doors (2) are hingedly attached to the container by means of a plurality of hinge assemblies (1) as defined in any one of claims 1 to 5.
- 35 7. A container as described in claim 6 in which the container is of the side opening type.

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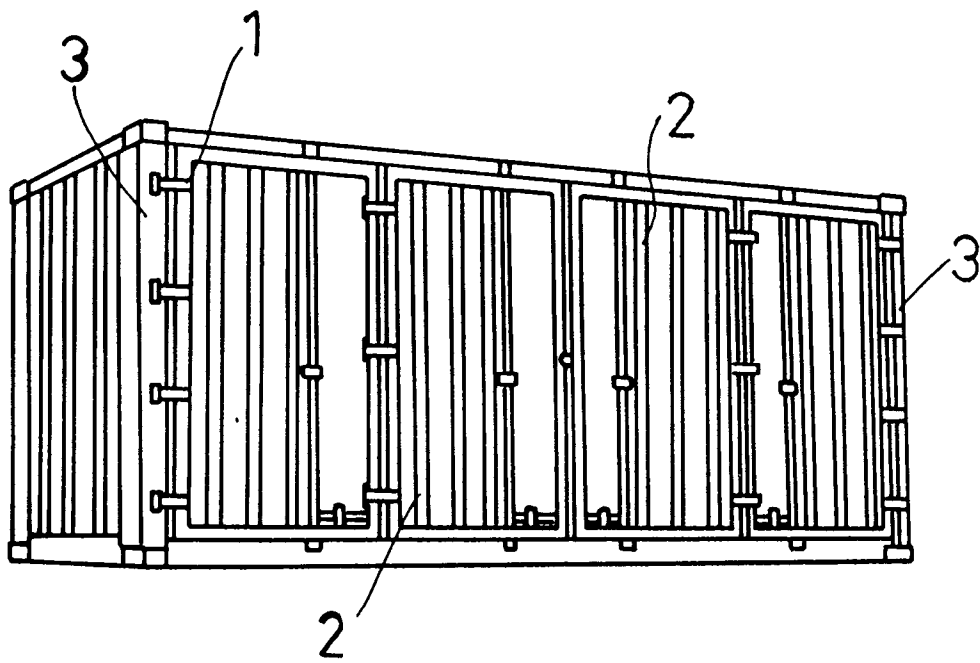


FIG. 1

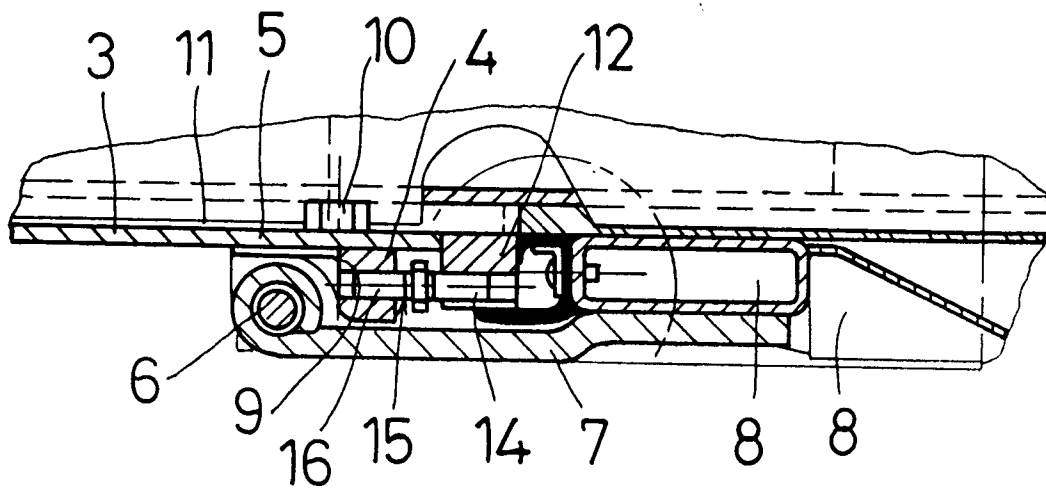


FIG. 2



European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 93 30 7394

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
Y	US-A-2 839 778 (HUTCHINSON ET AL) * column 1, line 63 - column 2, line 46; figures 1-4 *	1	E05D7/04
Y	FR-A-2 606 065 (SAFENICE) * page 3, line 20 - line 27 * * page 4, line 35 - page 5, line 15; figures 1,2 *	1	
A	DE-A-27 03 995 (GRETSCH & CO GMBH) * page 17, last paragraph - page 18, paragraph 1; figures 11,12 *	1	
A	DE-U-90 13 495 (HELMUT WEISBENDER GMBH & CO KG) * page 9, last paragraph; figure 1 *	1,2	
A	DE-A-26 10 173 (SYCO PRODUKT-ENTWICKLUNGSGESELLSCHAFT M.B.H.) * page 10, line 27 - page 11, line 6; figure 2 *	2	
A	CH-A-443 052 (EGO WERKE AG) * column 2, line 5-13; figures 1,2 *	3	TECHNICAL FIELDS SEARCHED (Int.Cl.5)
A	AT-B-370 491 (JULIUS BLUM GESELLSCHAFT M.B.H.) * page 2, line 36 - page 3, line 8; figure 1 *	3,5	E05D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 3 January 1994	Examiner Van Kessel, J
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

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