TRANSLATION

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A DEVICE FOR SECURING A CONTAINER

Description

The invention is directed to a device for securing a container, which is provided with lower frame elements of rectangular hollow profile and with corner fittings each having a corner opening, to fixing members.

A container having frame elements and corner fittings of this type is disclosed in DE-A-3 239 620. The concept involved is one which is especially suitable for medium containers of a width of 2200 mm, which are stackable only in twos or threes. If corner fittings according to ISO 1161, as provided for internationally standardized transcontainers with rated loads of up to more than 30 tons (corresponding to about 300 kN) and at least sixfold full stackability, were secured to such medium containers for rated loads of about 10 tons (corresponding to about 100 kN), which corner fittings are correspondingly heavy and require appropriately dimensioned frame elements, such frame elements and corner fittings would be oversized by a factor of 3 or more for medium containers. On the other hand, the corner fitting described in the mentioned Offenlegungsschrift is lighter and of smaller size and may be used in conjunction with correspondingly lighter frame elements of the type sufficient for medium containers; consequently, however, the corner fitting is not in accordance with ISO 1161 and may not readily be used with the twistlocks provided in said standard and mounted on the loading areas of vehicles intended for the transport of standar-

dized containers. Moreover, the outer dimensions of the described medium containers deviate from the spacings at which the mentioned twistlocks or bolts are mounted on such vehicles.

It is the object of the invention to secure containers of the above-specified kind to fixing members such as provided on vehicle loading areas or on the decks of ships. A more specific object of the invention resides in securing containers with corner fittings that are not in accordance with the international standard ISO 1161 to standardized fixing members, especially twistlocks according to ISO 1161.

The solution of this object in accordance with the invention is specified in the characterizing part of claim 1. The locking pieces provided in accordance therewith, which are movable inside the frame elements of the container and are adapted to be partially passed outwards through the corner openings of the respective corner fittings, constitute a kind of transition pieces which, on the one hand, in the region intended for engagement with the fixing members include cutouts configured in accordance with the usually standardized respective fixing members and on the other hand are adapted to be dimensioned in accordance with the respective predetermined spacing between pairs of two respective fixing members provided transversely to the direction of travel. By being disposed inside the frame elements, the locking pieces may be designed as economic and simple accessories for the containers.

Advantageous improvements of the invention are characterized in the subclaims. Claim 2 relates to a specially simple and weight-saving configuration of the locking pieces; claims 3 to 6 relate to simple and functionally reliable measures for preventing withdrawal of the locking plate from the locking position; claims 7 to 9 relate to measures for level adjustment in the region of the locking plate; claims 10 and 11 relate to configurations by means of which the locking plates are held captive inside the frame elements; claim 12 is directed to a measure which permits insertion of the locking plate into the finished container frame; and

claim 13 relates to a reinforcing measure. The development of the invention according to claim 14 results in the advantage that the locking plate is supported in the direction of both lower frame elements connected to the respective corner fitting, thus anchoring the container at the corresponding fixing member with even greater strength. A further improvement of this anchoring results from the feature of claim 15 which is particularly suitable in connection with a twistlock forming the fixing member, wherein this twistlock is rotated upon fitting through the opening provided in the locking piece, whereby the container is retained also against tilting. The embodiments set forth in claims 17 to 19 refer to advantageous possibilities of housing a locking piece of greater width within the cross-section of the respective frame element.

Preferred embodiments of the invention will be described below with reference to the drawings. In the drawings,

Fig. 1 is a plan view of a locking plate according to a first embodiment,

Fig. 2 is a cross-section through the locking plate along the line II-II of Fig. 1,

Fig. 3 is a view of the locking plate according to Fig. 1 in the rest position when inserted in a container frame element,

Fig. 4 is a perspective view of the arrangement of Fig. 3, but with the locking plate in its locked position,

Fig. 5 is a plan view similar to Fig. 1 showing a locking plate according to a second embodiment,

Fig. 6 is an illustration of a container corner with the locking plate of Fig. 5 in the locking position,

Fig. 7 is a side view of the locking plate of Fig. 5,

Figs. 8, 10 and 12 are plan views of locking plates according to further embodiments, and

Figs. 9, 11 and 13 are diagrammatic end views of container frame elements within which the locking plates of Fig. 8, 10 and 12, respectively, are shown in their rest position.

The flat-steel locking plate 10 shown in Figs. 1 and 2 has an overall width B which is slightly less than the clear diagonal dimension of the container frame elements 11 shown in Fig. 3, which have rectangular and especially square cross-section. On one of its two longitudinal sides the locking plate 10 is provided with two cut-outs 12, 13 of which cut-out 12 extends right to the rear edge 15 of the locking plate 10 while the other cut-out 13 together with the cut-out 12 defines a web 16 and together with the front edge 17 of the locking plate 10 defines a web 18. The depth of the cut-outs 12 and 13 is selected such that the reduced width b of the locking plate 10 is somewhat less than the clear width ß of the frame element 11 (Fig. 3).

As shown in Fig. 2, the locking plate 10 is provided in the area of the webs 16 and 18 and along the front edge 17 with thick portions 20 formed by rectangular bending. Instead, it is also possible to provide the webs with beads or creases. The thickness of these portions is substantially equal to the sum of the material thicknesses of the lower legs of the frame element 11 and of the corner fitting 21 (Fig. 3). As will be apparent from Figs. 4 and 6, the thus dimensioned thick portions 20 have the effect that the lowermost surface of the locking plate 10 defined by them lies in the same plane as the bottom surface of the corner fitting 21. A further possible way of configuring the thick portions resides in the weld nuts described below with reference to Fig. 7.

The width of the web 16 of the locking plate shown in Fig. 1 is selected such that this web 16 may be passed through an edge hole 22 provided in accordance with Fig. 4 on the lower outer edge of the frame element 11. Depending on the configuration of the corner fitting 21, this edge hole 22 may also be provided in the corner fitting 21 itself, or it may be formed by corresponding cut-outs 23 on the frame element 11 and 24 on the corner fitting 21, as shown in Fig. 6.

The width and shape of the cut-out 13 depend on the width and shape of the fixing member, which in Fig. 4 is indicated in dashed lines and is assumed to be a fixed bolt 25,

for instance on the loading area of a vehicle, with respect to which the container comprising the frame elements 11, the corner fitting 21, and the locking plate 10 is to be locked. Such fixed bolts are provided especially on the loading areas of railway cars, where locking in vertical direction in order to accommodate vertical acceleration forces is not required. Especially, the bolt 25 may be configured such that it will fit into the corresponding lower location holes of standard corner fittings according to ISO 1161. The cut-out 13 on the locking plate 10 is configured to engage about said bolt 25 on three sides in the form of a C.

The container corner constituted in Fig. 4 by the frame elements 11, 26 and 27 and the corner fitting 21 is thus fixed in three directions, viz., in either direction of the longitudinal extension of the frame element 11 and in one direction of the longitudinal extension of the frame element 27. Locking in the fourth horizontal direction is achieved by the provision of a further locking plate 10 in the region of the other end of the frame element 27 in Fig. 4, said locking plate 10 being provided with a cut-out open in opposite direction relative to the cut-out 13 of the locking plate 10 shown in Fig. 4 and having said cut-out in engagemet about a bolt disposed in said region.

Fig. 3 shows the locking plate 10 in the rest position in which it is pushed into the frame element 11. In its diagonal position the locking plate is fully accommodated in the frame element 11. On the end of the frame element 11 facing the corner fitting 21 or even inside the frame element, shaped portions (not illustrated) cooperating with corresponding shaped portions (also not illustrated) on the locking plate 10 may be provided to prevent the locking plate 10 when in its rest position from slipping too far into the frame element.

Dropping-out of the locking plate 10 is prevented due to the fact that the corner hole 28 of the corner fitting 21, which for instance is configured as a quarter circle according to Fig. 3, is so dimensioned that the remaining clear radius dimension is smaller than the overall width B of the

locking plate 10. When the container is manufactured, the locking plate 10 is pushed into the frame element 11 prior to application of the corner fitting 21.

In Fig. 3, the frame element 11 is shown to have a square cross-section. Alternatively, lower frame elements having a rectangular cross-section can be installed in such a manner that their longer side extends vertically. In this case, locking plates having a larger overall width B may be used. Since the clear width ß of the frame element and thus the reduced width b of the locking plate are unchanged, the amount by which the webs 16 and 18 extend beyond the width b then becomes greater so that the fixing member is encompassed to an accordingly greater extent.

In use, the container to be locked is placed onto the respective loading area in such a way between two bolts 25 disposed along a transverse vehicle axis that these bolts are adjacent two corner fittings 21. Thereupon the two locking plates 10 in their diagonal position illustrated in Fig. 3 are drawn out to such an extent that the web 16 may pass through the edge hole 22 and the cut-out 13 may engage around the respective bolt 25. In this position the locking plate 10 drops into its horizontal position shown in Fig. 4, in which it secures the container relative to the bolt 25. The front edge 17 of the locking plate 10 may either abut the respective inner wall of the corner fitting or may terminate shortly before the same. In this position the locking plate 10 lies with its lower main surface flat on the lower leg of the frame element 11 and with the bottom face of the thick portions 20 lies on the loading area.

The portion 20 may also be sufficiently thick to impart to the locking plate 10 when in the locking position shown in Fig. 4 a slight inward inclination, which acts against inadvertent pivoting of the locking plate 10 into the non-locked position.

The embodiment of the locking plate 10' illustrated in Fig. 5 differs from the one shown in Fig. 1 in that a third, central cut-out 14 is provided which together with the rear cut-out 12 defines the web 16 and with the front cut-out 13

defines a further web 19. Moreover, the locking plate 10 according to Fig. 5 is provided on the opposite longitudinal side with a recess 29 extending right to the front edge 17, said recess having the effect that the locking plate 10' in its inclined position may be extended by a corresponding length through the corner opening 28 out of the corner fitting 21.

In the locking position shown in Fig. 6 the web 16 of the locking plate 10' passes through the edge hole 22' defined by the cut-outs 23 and 24 on the frame element 11 and the corner fitting 21, respectively, and the cut-out 13 engages about the foot 30 of the fixing member, which in this embodiment is configured as a twistlock 31 in accordance with ISO 1161, wherein the web 19 fits between the corner opening 28 and said foot 30. Due to the fact that the locking plate 10' is adapted to be extended for some distance out of the corner fitting 21 and the cut-out 13 in the extended locking position lies outside by a corresponding distance, the container is now fixed relative to the fixing member in such a way that the latter is fully in the region of the corner opening 28. When, as assumed in Fig. 6, the locking member is configured as a twistlock, the head thereof may be twisted and now causes securing of the locking plate 10' and thus of the container also in vertical direction. Such a twistlock fixing against vertical acceleration is indicated especially when containers are transported on loading areas of road vehicles.

In conjunction with a locking operation on a twistlock shown in Fig. 6 it may be appropriate to provide the thick portion of the locking plate 10' by means of nuts 32 (Fig. 7) of corresponding thickness rather than by means of the bent portions shown at 20 in Fig. 2, said nuts being welded to the underside of the locking plate 10' in the region of the webs 16, 18, 19. As illustrated in Fig. 5, the web 18 is moreover provided with a bore 33 which is in alignment with the threaded bore of the nut 32. When the locking plate 10' has been locked by means of the twistlock 31 of Fig. 6, this locking assembly may additionally be tightened by means of a tighten-

ing screw 34 threaded from above through the nut 32 and extending from the underside thereof. The same tightening may also be provided, if required, in the region of the web 19 according to Figs. 5 and 6. When the locking plate webs are elevated in this way by means of tightening screws, a wedge effect will moreover result between the side edges of the webs 16, 19 and the adjacent bordering edges of the edge hole 22 and the corner opening 28, said wedge effect improving the strength of the locking assembly.

As indicated in dashed lines in Fig. 5, the corner recess 29 may be extended considerably towards the rear, so that the cut defining this extended corner opening 35 towards the rear is approximately in alignment with the edge defined between the web 16 and the cut-out 14. With this configuration the locking plate 10' may be manoeuvred into the frame element 11 even after securing of the corner fitting 21 through the corner opening 28 of the latter, but in that case it will be very securely retained against inadvertent dropping-out. The overall width B, which in this configuration will only remain in the region of the web 16, is sufficient for the proper functioning of the locking plate 10' . To improve the rigidity of the locking plate 10' it is further possible to provide on the top surface thereof a stiffening rib 36 extending in longitudinal direction of the plate. If required, this rib may also have sections branching into the regions of the webs 16, 18 and 19. A similar stiffening rib may also be suitable in the locking plate 10 according to Fig. 1, provided the required stiffness is not achieved by the thickness of the plate material.

The locking plate 40 shown in Fig. 8 consists of two plates 41 and 42 interconnected by a schematically shown hinge 43. At its left end the plate 41 has a portion of the width b which corresponds to the width b in Fig. 1 and is slightly smaller than the clear width ß of the frame element 11 indicated in Fig. 3. The main portion of the plate 41 has a larger width and includes a slot 44 extending from the edge of the plate 41 opposite to the hinge, so that two projections 45 and 46 are produced at this edge. The plate 42 is

provided with an oblong opening 47 which is so shaped that it fits over a twistlock according to ISO 1161. In the embodiment of Fig. 8, the axis of the hinge 43 extends along the inner edge of the opening 47.

Fig. 9 shows how the locking plate 40 of Fig. 8 in its rest position can be completely inserted into the frame element 11. For anchoring the container, the locking plate 40 is withdrawn from the frame element to such an extent that the projection 45 is positioned in the area in which the lower frame element 27, which extends perpendicularly to the frame element 11, terminates at the corner fitting 21. When the locking plate 40 is now unfolded to its straight condition, the slot 44 will engage the wall of the corner fitting 21, with the projection 46 being outside the corner fitting 21. The opening 47 surrounds the fixing member. In case this fixing member is formed by a twistlock, the latter will subsequently be rotated by 90° to secure the locking plate 40, thus the container, against both sliding and tilting.

The locking plate 40' shown in Fig. 10 distinguishes from the locking plate 40 of Fig. 8 in that the axis of the hinge 43' is positioned outside the opening 47 so that both plates 41' and 42' have substantially the same width. In this case, the hinge 43' terminates at its left-hand end at a cut 48. Fig. 11 shows how the locking plate 40' of Fig. 10 is housed in its rest position within the frame element 11.

The locking plate 50 of Figs. 12 and 13 has a plate 51 the main portion of which substantially corresponds to the shape of the plate 41 of Fig. 8. At its edge opposite to the slot 44, a flap 52 is formed integrally with the plate 51, which flap 52 extends through a ring 53 and is folded back onto the main portion of the plate 51. As shown in Fig. 13, the cross-section of the inner leg 54 of the ring 53 is circular so that the ring 53 is connected to the plate 51 in a hinge-like rotatable manner. The outer leg 55 of the ring 53 has a thickness which is equal to the sum of the diameter of the inner leg 54 and twice the thickness of the plate 51. This measure is indicated at d in Fig. 13 and is so selected that the outer ring leg 55 in the working position of the

locking plate 50, stands vertically on the support when the plate 51 lies flatly on the inner surface of the frame element 11. The clear dimension of the ring 53 available in view of the thickness of the flap 52 forming the hinge corresponds to the shape of the opening 47 in the locking plates of Fig. 8 and 10.

It has been assumed in all above embodiments that the locking plate is inserted into the frame element 11 and retained there against becoming lost when not used for securing the container. Alternatively, the frame element 11 or the frame element 27 may be provided at its upper inner edge in the vicinity of the corner fitting 21 with a slot, and the locking plate may be inserted through such slot into the respective frame element. This manner of storing the locking plate may be suitable if the overall width of the locking plate is larger than the clear diagonal dimension of the frame element and the locking plate has no hinge.

Claims

1. A device for securing a container, which is provided with lower frame elements (11) of rectangular hollow profile and with lower corner fittings (21) each having a corner opening (28), to fixing members (25, 31), characterised by locking pieces (10, 40, 50) movable within the frame elements (11) and each having a portion (18, 19, 42, 53) adapted to be passed outwards through the corner opening (28) of a corner fitting (21), said portion having a cut-out (13, 47) for engagement with a fixing member (25, 31).

2. The device of claim 1, characterised in that the locking piece is formed as a flat elongated plate (10) having lateral cut-outs (12...14).

3. The device of claim 2, characterised in that the overall width (B) of the plate (10) corresponds to the clear diagonal dimension of the frame element (11), and the width (b) reduced by the depth of the lateral cut-outs (12...14) corresponds to the clear width (β) of the frame element (11).

4. The device of claim 3, characterised in that a longitudinal side of the plate (10) is provided with two cut-outs (12, 13), one (12) of which extends to the rear edge (15) of the plate facing away from the corner fitting (21) and the other (13) has a width corresponding to the fixing member (25, 31).

5. The device of claim 4, wherein the frame element (11) and/or the corner fitting (21) has an edge hole (22) in the outer edge facing away from the container, characterised in that the web (16) formed between the two cut-outs (12, 13 or 12, 14, respectively) of the plate (10) has a width corresponding to the clear length of the edge hole (22).

6. The device of claim 5, characterised in that the plate (10') has three cut-outs (12...14) in the said longitudinal side, two (13, 14) of which form a web (19) engaging between

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an edge of the corner opening (28) of the corner fitting (21) and the surface of the fixing member (31) facing that edge.

7. The device of any one of claims 2 to 6, characterised in that the underside of the plate (10) has a thick portion (20, 32) provided in the region of the webs (16, 18, 19) formed by the cut-outs (12...14).

8. The device of claim 7, characterised in that the thick portion (20, 32) corresponds to the sum of the material thicknesses of the lower legs of the corner fitting (21) and the frame element (11).

9. The device of claim 7 or 8, characterised in that the thick portion is formed by a nut (32) welded to the underside of the web (18), with a tightening screw (34) being threadable into the nut.

10. The device of any one of claims 2 to 9, characterised in that the plate (10) has an abutment (13) engaging the inner side of the surface of the corner fitting (21) facing away from the frame element (11).

11. The device of claim 10, wherein the corner opening (28) of the corner fitting (21) is formed by quarter-circular arcs, characterised in that the clear radial dimension of the corner opening (28) is smaller than the overall width (B) of the plate (10).

12. The device of any one of claims 4 to 11, characterised in that the longitudinal side of the plate (10') opposite its cut-outs (12, 13) has a corner recess (35) extending to the front edge (17) of the plate.

13. The device of any one of claims 2 to 12, characterised in that the plate (10') has a stiffening rib (36) on its top surface.

14. The device of claim 2, characterised in that the edge of the plate (40, 50) opposite the cut-out for engagement with the fixing member (25, 31) is provided with an integral portion (44, 45) for engagement with the corner fitting (21) in the region of that frame member (27) which extends perpendicularly to the frame member (11) in which the plate (40) is movably received.

15. The device of claim 1 or 14, characterised in that the cut-out is formed as an opening (47) completely surrounding the fixing member (25, 31).

16. The device of claim 15, characterised in that the locking piece (40, 50) includes a hinge (43, 53, 54) extending along the moving direction.

17. The device of claim 16, characterised in that the hinge (43, 53, 54) extends along the inner confining line of the opening (47).

18. The device of claim 17, characterised in that the opening is formed by a ring (53) the inner leg (54) of which is engaged in an eye formed by a folded-back portion (52) of the plate (51).

19. The device of claim 18, characterised in that the thickness (d) of the outer ring leg is equal to the sum of the thickness of the inner ring leg (54) and twice the thickess of the folded-back plate portion (52).

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