

[54] **POST STRAP FITTING**

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[51] Int. Cl. **A44b 17/00, A44c 5/18**

[58] Field of Search **24/201 A, 265 B, 265 CD; 248/223, 361 A**

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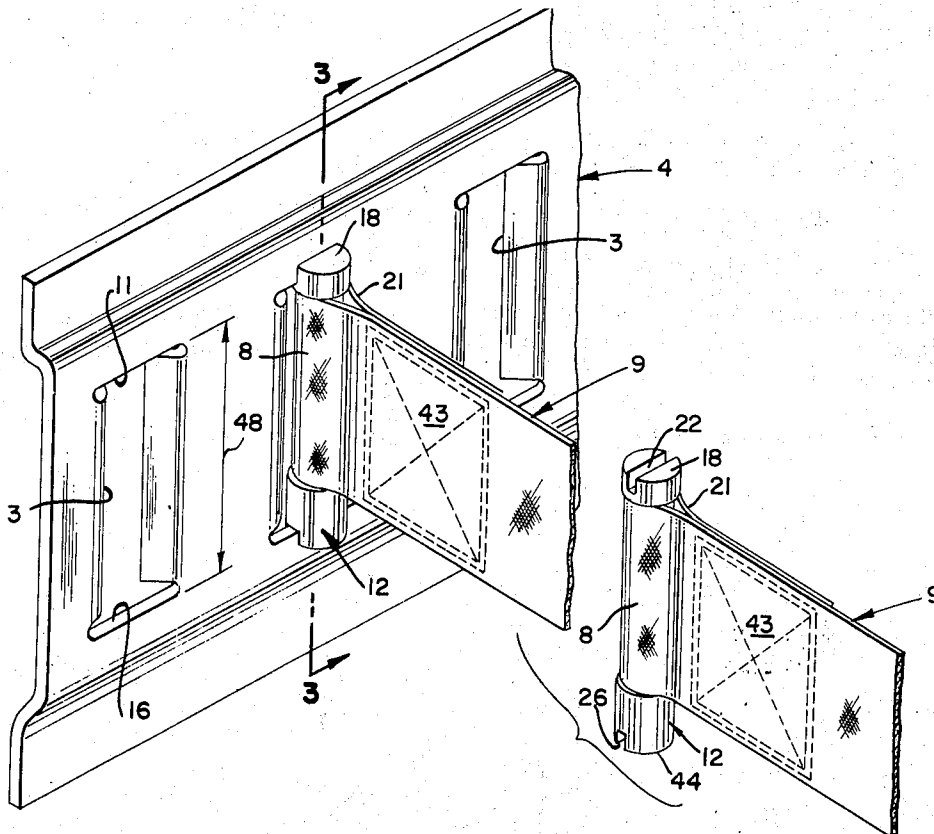
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[57] **ABSTRACT**

An end fitting for an adjustable strap having a post for receiving a loop of the strap, an end cap slidably mounted on the post and a spring biasing the post and cap longitudinally away from one another. The ends of the post and cap having a slot therein for engagement with a load rail.

3 Claims, 8 Drawing Figures



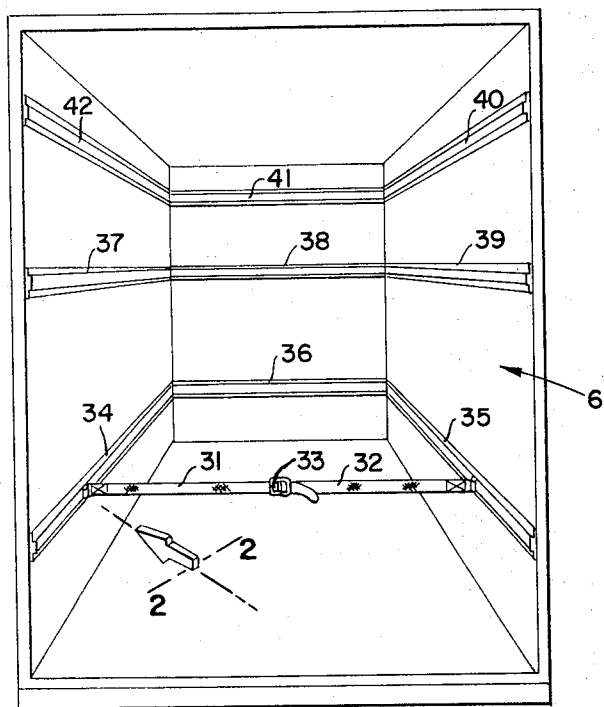


FIG. 1

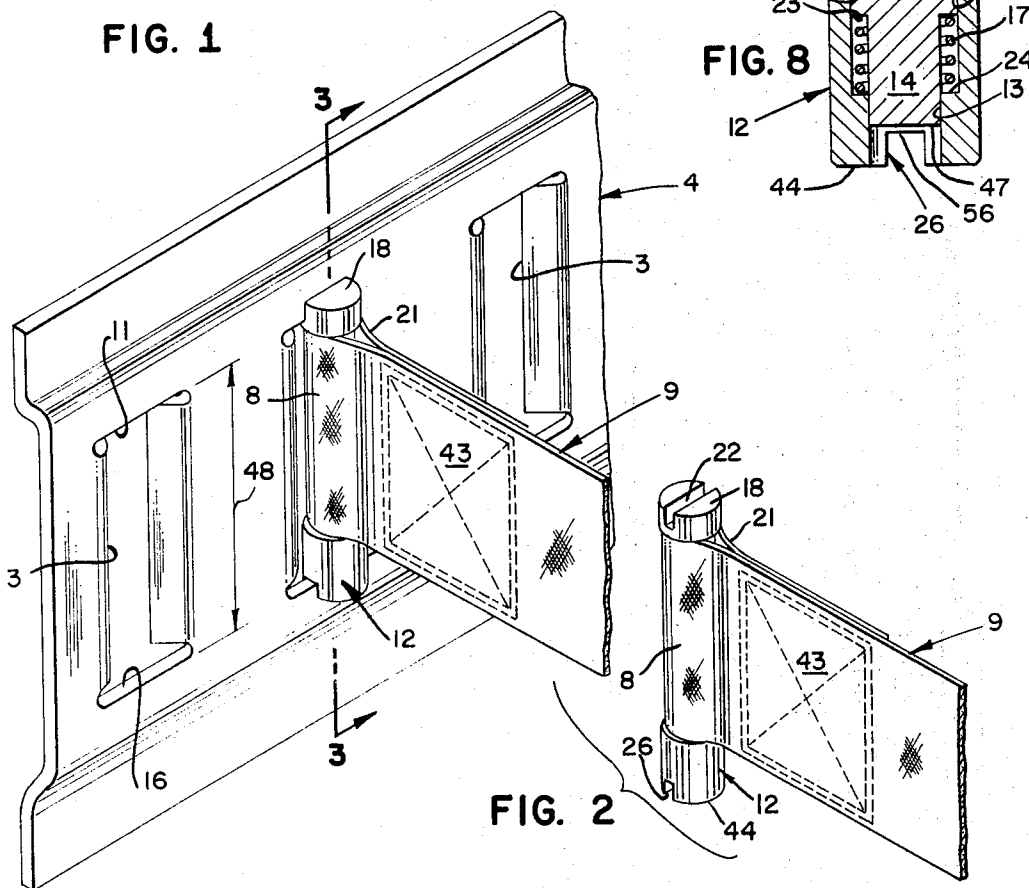


FIG. 2

FIG. 8

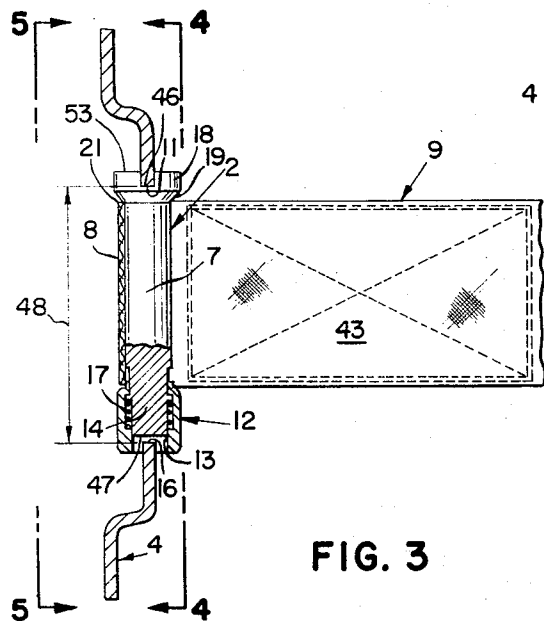


FIG. 3

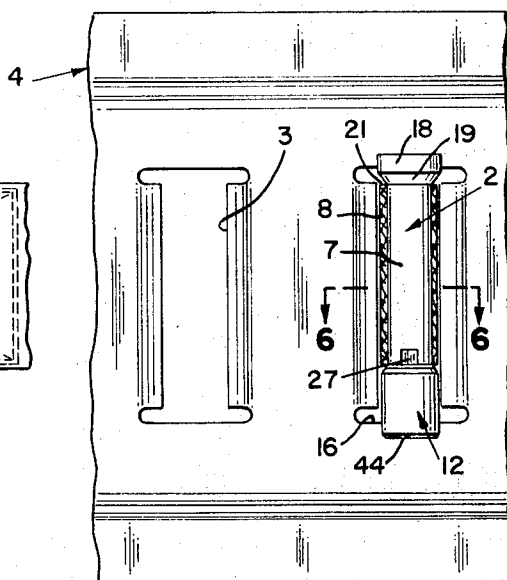


FIG. 4

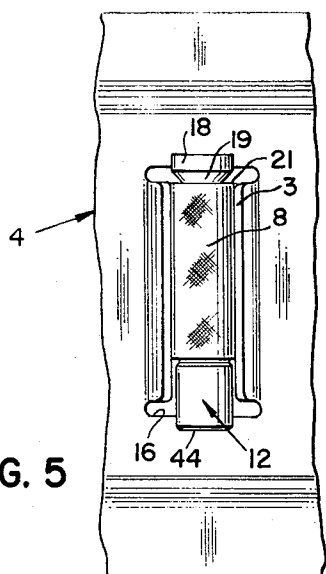


FIG. 5

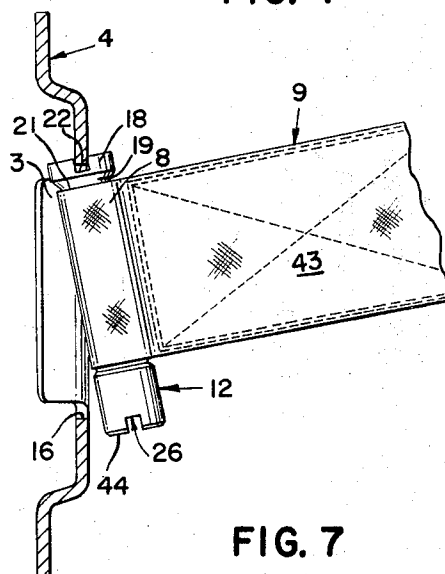


FIG. 7

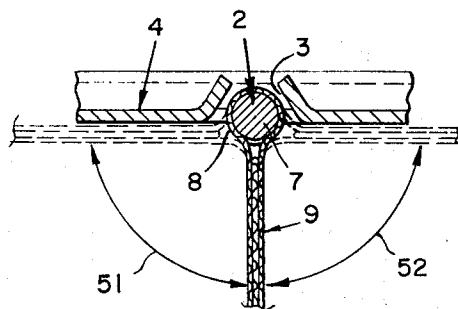


FIG. 6

POST STRAP FITTING

BACKGROUND OF THE INVENTION

This invention relates to the fittings used in the transportation industry to secure flexible belts to load rails mounted on the sides of the containers. The straps are used for holding the objects in partially loaded containers so that they will not shift within the container and damage the goods by either striking the sides of the containers or other items within the container. The load rails are mounted in such containers as trucks, railroad cars, airplanes and ship containers.

Examples of strap fasteners may be found in such patents as S. Rennert U.S. Pat. No. 3,323,186 and D. F. Lewis U.S. Pat. No. 3,477,104. Another end fitting is manufactured and sold by Aeroquip Corporation, a subsidiary of Libbey Owens-Ford Company and is identified by Part No. FE7067-1. (The Aeroquip fitting is marked patent pending and will be identified by patent number if granted and if known.) See also D. F. Lewis, Ser. No. 279,342 filed Aug. 10, 1972 group 314.

In many applications of the above identified fittings, the cargo can be damaged by the fittings themselves if the load shifts against the protruding metal parts.

SUMMARY OF THE PRESENT INVENTION

The gist of the present invention is to provide such a narrow profile to the fitting that damage to the cargo by accidental shifting against the fitting is almost impossible.

A further object of the present invention is to provide an end strap fitting which is stronger than present fittings, is easy to operate, maintenance free and relatively inexpensive.

A further object is to provide a fitting which presents a round profile so that it will not cut or tear the strap or damage the cargo.

Another object is to provide a fitting which has symmetric holding in that it can be placed in a load rail and the strap can be placed on either side of the load rail.

A further object is to provide a fitting in which the axis of the fitting and the strap loop are on the center line of the load rail and present a profile which is nearly flush with the face of the load rail.

Still another object is to provide a fitting which will permit the strap to pivot a full 180° without imposing torque forces or leverage forces on the fitting.

Another object is to provide a fitting which can be installed in either vertical end position.

A further object is to provide an end fitting which will resist damage upon being accidentally overrun by fork-lift trucks used to load and unload the cargo container.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a mobile cargo conveyance illustrating the use of the post strap fitting constructed in accordance with the present invention.

FIG. 2 is an enlarged perspective view of the device of the present invention inserted in a cargo rail along the view indicated by the large arrow in FIG. 1. An offset view shows the identical device prior to being inserted in the cargo rail.

FIG. 3 is an end view of the device with portions in cross section taken substantially along the line 3—3 of FIG. 2.

FIG. 4 is a side view of a load rail with the device inserted in an opening taken substantially along the line 4—4 of FIG. 3.

FIG. 5 is a side view of the device taken substantially along line 5—5 of FIG. 5 showing a portion of the back-side of a load rail.

FIG. 6 is a cross sectional view of the device, load rail and strap taken substantially along line 6—6 of FIG. 4.

FIG. 7 is an end view of the device prior to attachment or removal from a load rail which is shown in cross section.

FIG. 8 is an enlarged side view of the invention with portions in cross section.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

The cargo strap fitting of the present invention consists briefly of an elongated post member 2 adapted for insertion into an opening 3 of a load rail 4 for a mobile cargo container 6 having a body portion 7 adapted for receiving a loop 8 of a strap 9 and having means adapted for engagement with the edge wall 11 of the opening in the load rail; a sleeve 12 having an opening 13 for slidably receiving an end 14 of the post member and having means adapted for engagement with an opposite edge wall 16 of the opening in the load rail; and biasing means 17 operably engaging the post and the sleeve and urging the members in spaced relation.

The post member is formed with a head 18 with a cross section greater than the body portion presenting a shoulder 19 adapted for engaging the edge 21 of the strap and a slotted portion 22 adapted for engaging the edge wall 11 of the opening 3 in the load rail.

The post member and sleeve are held apart by forming a shoulder 23 on the post end opposite the head and a shoulder 24 within the sleeve cap opening and inserting a spring 17 therebetween.

The sleeve cap member is formed with a groove or opening 26 which is adapted for engaging the other edge wall 16 of the load rail.

One of the features of the present invention is the fact that there are alignment means to maintain the head and sleeve slots in parallel alignment to assist in attaching the fitting to the load rail. The alignment means may be accomplished by forming a groove or flat surface area 27 or a second groove 28 in the body portion of the post which is in registering engagement with a projection 29 or a second projection 31 formed on the sleeve cap. The grooves 27 and 28 have a length somewhat greater than the normal travel of the cap along the post.

Although the body portion of the post could be of various geometric cross sections, obviously, a circular cross section is preferred so that there will be no sharp edges to cut the strap. The slots in the post and sleeve are preferably on lines intersecting the axes of the post and sleeve so that the axis of the fitting is substantially on the center line of the opening in the load rail as shown in FIG. 6.

The overall length of the post member from top surface 53 to bottom surface 47 is greater than the length of the opening in the load rail from edge 11 to edge 16. The distance between the base of the slot 46 in the

head and the other end 47 of the member is somewhat shorter than the length of the opening in the load rail from edge 11 to edge 16.

OPERATION OF THE INVENTION

Referring to FIG. 1, the fittings of the present invention are placed on ends of straps 31 and 32. The straps are joined by an adjustable buckle 33. Load rails 34 through 42 may be placed in various positions in the cargo container and may even be placed in a vertical direction.

The post member is attached to the strap as shown in FIG. 2 with a tight loop being made around the body portion and between the head and the sleeve cap and is sewn at portion 43. The sleeve cap may be either at the top or at the bottom when inserted in the load rail, but preferably the sleeve is located at the lower end. To place the device on a load rail, the slot 22 of head 18 is first inserted into the edge of the opening as shown in FIG. 7. Next, the sleeve cap is moved against spring 17 until the end 44 of the sleeve cap clears the bottom edge 16 of the rail opening. The post is pivoted inwardly toward the load rail until the slot 26 is in alignment with the bottom edge 17 of the opening. The sleeve is easily depressed with the thumb. When the slot is in alignment, the spring biases the groove of the sleeve into engagement with the load rail. As shown in FIG. 3, the distance between the base of the slot 46 and the end of the post 47 is just somewhat shorter than the length of the opening in the load rail as shown by the double arrow 48.

To release the device from the load rail, the reverse procedure is followed with the sleeve being depressed, the post pivoted outwardly about pivot point 46 on the head and then the device is moved downwardly to release slot 22 from the load rail.

As shown in FIG. 6, the strap may be moved in a full 180° arc shown by arrows 51 and 52. Note further that the post and sleeve do not move, but rather that strap slidably rotates the post body 2.

As shown in the drawings, the strap loop encircles the entire device so that the connection with the load rail can be made stronger than the load rail itself. Tests have proved that the load rail fails before the device of the present invention. By spreading the contact area of the belt on the device over a wide area, the belt is less likely to fail and of course not having any sharp corners, the belt tends to last much longer.

The device is fail safe in that should the spring 17 fail, the device will not part from the rail since the sleeve will fall by gravity and the slot will remain engaged with the edge 16 of the load rail. As long as the sleeve is in place, the post cannot separate from the load rail because the length of the device from the bottom of the slot 46 to the end of the post 47 is just somewhat shorter than the distance of the opening in the load rail. The post cannot drop down beyond edge 16 and thus top 53 will not fall below the edge 11 of the load rail.

The sleeve cap 12 will not separate from the post, since the projections 29 and 31 catch on shoulders 54 and 55.

Normally the base 56 of slot 26 rests on edge 16 of the load rail. Any upward movement of strap 9 will not release the sleeve by compressing 17 since the strap will merely move against shoulder 19 which will in turn cause the base 46 of the slot 22 to move into engage-

ment with edge 11. In a similar manner, downward force on the strap will not release the device from the load rail since the strap will force sleeve cap 12 into a more tightly held position with the load rail. As is evident from the drawings, the body portion is symmetrical and it matters not whether the strap is positioned to the right as shown in FIG. 3 or to the left.

One method for forming the projections 29 and 31 which slide in the alignment grooves 27 and 28 is to form an annular ring around the sleeve member and then topeen or bend a small portion of the ring towards the center of the sleeve.

I claim:

1. A cargo strap end fitting for securing a strap to an elongated plate load rail member having front and back parallel planar faces and formed with a plurality of longitudinally spaced, transversely elongated rectangular slots; the end fitting comprising in combination:

a. an elongated solid post member having;

1. a solid, cylindrical body portion adapted for slidably receiving a strap loop in close fitting encirclement permitting repositioning of said strap upon pivoting movement of said strap, and having a diameter substantially less than the width of said rail slot so that the center line of said post member and the center line of said strap loop coincide with the center line of said load rail;

2. a head portion formed on an end of said body portion and being formed with a transverse slot opening to the sides and end of said head portion wherein the bottom wall of said slot is adapted for axial abutting registration with the top edge of said rectangular rail slot and the slot has parallel spaced sidewalls adapted for sliding interlocking engagement with the front and back faces of said load rail;

3. shoulder means formed on said body adjacent the distal end of said body portion for retaining a spring means;

4. the distance between the top surface of said head portion and the distal end of said body portion being greater than the length of said rail slot and the distance between the bottom wall of said slot and the distal end of said body portion is substantially equal to but less than the length of said rail slot;

5. a sleeve engaging stop means formed on said post member adjacent the distal end;

b. a sleeve cap having;

1. an axial bore for slidably receiving and engaging the distal portion of said post member having a first portion engaging the lower edge of said rectangular rail slot and a second position releasing said sleeve cap and post member from said load rail, by application of finger pressure to said sleeve cap;

2. stop means formed on an end of said cap for engaging said stop means formed on said post preventing separation of said cap from said post member;

3. a transverse slot having bottom and parallel side walls formed in the distal end of said cap and opening to the sides and end for releasably receiving the bottom edge of said load rail slot in abutting relation with the bottom wall of said slot and the slot side walls are in sliding interlocking

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- engagement with the front and back faces of said load rail;
- 4. a spring shoulder formed within the bore on said sleeve cap;
- 5 c. a spring encircling said post member and engaging said shoulder means on said body and said spring retainer shoulder on said sleeve cap and urging said sleeve cap toward said first position of said sleeve cap;
- 10 d. said groove in said post member head and said groove in said sleeve cap being in parallel alignment when in engagement with the top and bottom edges of said slot in said load rail to permit sliding of said fitting along the longitudinal axis of said load rail within said slots; and
- 15 e. said post member and said sleeve cap presenting a low profile with minimum protrusion from said front and rear faces of said load rail.
- 2. A cargo strap fitting as described in claim 1 comprising:
- 20 a. said head portion of said post member having a diameter greater than the diameter of said body portion, and being formed with a beveled shoulder at

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- the juncture of said head and body portion for slidably engaging the upper end of said strap and resisting axial sliding of said strap above said shoulder; and
- b. said sleeve cap having a diameter exceeding the diameter of said body portion of said post member slidably engaging the lower end of said strap and resisting axial sliding of said strap below the top end of said sleeve cap.
- 3. A cargo strap fitting as described in claim 1 comprising:
- a. groove means formed in the distal portion of said post along the longitudinal axis of said post member; and
- b. groove registering means formed in said sleeve cap member for sliding registration with said groove means of said post member preventing rotation of said sleeve cap relative to said post member, thereby maintaining said slot in said post head and said slot in said sleeve cap in alignment parallel to the longitudinal axis of said load rail.

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