CARGO SECURING DEVICE

Inventor: Thomas S. Bowers, Lake Forest, Ill.

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Primary Examiner—Drayton E. Hoffman
Attorney—Walter E. Pavlick

ABSTRACT

The cargo securing device is welded in an opening in the deck of a vessel with the top thereof flush with the deck and is composed of a pair of members having openings therein cooperating to form a socket in which a spherical shaped member is mounted. The spherical member has a belt attaching eye projecting outwardly from its surface and adapted to move through aligned slots in the members in registry with the socket so that the eye may be moved either above or below the deck. The spherical member is retained within the socket and is universally pivotable with respect thereto so that the eye may be moved to a plurality of positions either above the deck or below the deck.

10 Claims, 5 Drawing Figures
CARGO SECURING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention
The field of the invention broadly relates to structures for tying down and holding cargo in any type of transport vehicle such as a seagoing vessel, a railroad freight car, or a truck.

2. Description of the Prior Art
A wide variety of load control or securing devices and methods are currently in use. In the great majority of these devices, a support member is fixedly secured to the deck or wall with separate members detachably secured to the support member. The support member may have irregular openings such as shown in U.S. Pat. No. 1,739,829, issued Dec. 17, 1929 to G. C. Federman, with the detachable member being of irregular shape and fitted through the opening and then being pivoted so that it is retained in the support structure. With such arrangements, the detachable members are constantly being lost or misplaced. In addition, many of the detachable members are only pivotable in a single direction. Furthermore, when the pivotable member is fixedly secured to the support member, such as shown in U.S. Pat. No. 3,147,716, issued Sept. 8, 1964 to C. L. Klasing, Jr., not only is the pivotable member not universally pivotable but such structures heretofore have been useable only on one side of a wall or either above or below a deck to which it is mounted.

SUMMARY OF THE INVENTION
It is an object of this invention to provide a cargo securing device or tie-down structure which is fixedly secured to its supporting structure and thus may not be lost or misplaced.

Another object is to provide a cargo securing device which is universally moveable with respect to its supporting structure.

Another object is to provide a cargo securing device which, when mounted, may be easily useable to tie down cargo on either side of a wall or, either above or below a deck on which it is mounted.

A further object is to provide a tie down structure which is universally pivotable on both sides of its supporting structure.

Still another object of the invention is to provide a tie down device mounted flush with the deck with the strap securing eye out of the way when not in use.

These and other objects and advantages will become apparent as the description proceeds.

BRIEF DESCRIPTION OF THE DRAWINGS
FIG. 1 is an exploded perspective view illustrating the various parts making up the invention as they are about to be assembled to a deck;

FIG. 2 is a front elevational view of the cargo securing device incorporating this invention mounted on the deck with the belt securing eye being pivoted through the eye positioning slot;

FIG. 3 is a bottom view of the cargo securing device shown in FIG. 2;

FIG. 4 is a view similar to FIG. 2 with the belt securing eye pivoted above the deck and in use; and

FIG. 5 is a view similar to FIG. 4 but with the belt securing eye pivoted beneath the deck.

DESCRIPTION OF THE PREFERRED EMBODIMENT:
Referring more particularly to FIG. 1, the cargo securing device is simple in construction and consists of basically three major parts. An upper plate member 10 and a lower plate member 12 are adapted to cooperate with each other with the spherical member 14 disposed therebetween. The spherical member 14 has an attaching eye 16 formed integral therewith and adapted for movement either above the upper plate member 10 or below the lower plate member 12 as desired. The entire assembly of the upper plate 10, the lower plate 12, and the spherical member 14 is positioned within an aperture 18 of a deck 20.

In more detail, the upper plate member 10 in the embodiment shown is of rectangular configuration. Disposed on the upper surface of plate member 10 is a raised portion 22 also of rectangular configuration but having dimensions smaller than those of the main plate member 10. The thickness of the raised portion 22 is also of a lesser dimension than the thickness of the main plate portion 10 but is substantially similar to the thickness of the deck 20 in which it is to be mounted.

As shown clearly in FIG. 2, the rectangular aperture 18 is provided in the deck 20 substantially the same size as the rectangular raised portion 22 of the upper plate 10. Accordingly, the raised portion 22 fits snugly in the aperture 18 and the upper plate is suitably secured to the deck, as by welds 24. As is apparent from viewing FIG. 2, the upper surface of the raised portion 22 is flush with the upper surface of the deck 20 so as not to present an obstacle to walking across the deck.

A generally circular opening 26 is provided in the upper plate member 10 on one side of the plate. A slot 28 is also provided in the upper plate 10 and is in registry with and extends from the circular opening 26 and terminates short of the opposite side of the plate. In the embodiment shown, the width of the slot 28 approximates the radius of the circular opening 26 with the slot extending substantially on the center line of the upper plate 10. Adjacent the circular opening 26 and extending the thickness of the main portion of the upper plate 10 is a curved surface 30 which serves as a seat for the spherical member 14.

The lower plate member 12 is of generally elliptical configuration and has a circular opening 32 with a slot 34 in registry therewith and extending toward the opposite side from which the circular opening is located. The circular opening 32 in the lower plate and the slot 34 are substantially similar to the circular opening 26 and the slot 28 in the upper plate. Adjacent the circular opening 32 of the lower plate 12 and extending a portion of the thickness thereof is a curved surface 36 extending in ring-like fashion and providing a seat for the spherical member 14 similar to the seat 30 in the upper plate.

It is apparent that when the lower plate 12 is secured to the upper plate 10, as by a weld 38 extending around the periphery of the lower plate, with the spherical member 14 positioned between the plates, the seats 30 and 36 in the upper and lower plates respectively cooperate to form a socket in which the spherical member 14 is mounted for pivotal movement. The spherical member 14 is of a curvature substantially similar to the curvature of the seats 30 and 36 and is of
a diameter greater than the circular openings 26 and 32 so that the spherical member 14 is retained by the upper and lower plates 10 and 12.

Extending outwardly from one side of the spherical member 14 is the attaching means or eye 16. While the attaching eye may be of numerous configurations it is here shown as being a ring with a stem extending from one side to connect the ring to the spherical member 14. A basic requirement of this invention is that the attaching eye 16 have a dimension smaller than the aligned slots 28 and 34 in the upper and lower plate members so that the eye 16 may pass through the slots to be positioned either above the upper plate 10 or below the lower plate 12. In the embodiment shown, the thickness of the attaching eye 16 is lesser than the width of the slot 28 and 34 so that the attaching eye may pass through the slots. However, when the attaching eye is either above or below the plates 10 and 12 and pivoted, the width of the attaching eye is greater than the width of the slots so as to prevent movement of the attaching eye through the slots. Accordingly, once the attaching eye is placed either above or below the plate, it will be retained in the position either above or below the plate until the spherical member 14 is pivoted within the socket so that the thickness of the eye is aligned with the slot 28 and 34 to permit passage therethrough.

It is apparent that when the attaching eye 16 is positioned above the upper plate 10, the attaching eye may be pivoted in a multitude of directions with such universal pivotal movement being accomplished by rotation of the spherical member 14 in the socket provided by the seats 30 and 36. At the upper portion of the circular opening 26 in the upper plate 10, an outward bevel is provided at 40 to further increase the angle at which the attaching eye may move with respect to the upper plate.

Likewise, when the attaching eye 16 is positioned beneath the lower plate 12, it may be pivoted in a multitude of directions and such universal pivotal movement is also accommodated by rotation of the spherical member 14 in the socket and angular movement of the attaching eye with respect to the lower plate is increased by an outward bevel 42 similar to the bevel 40 of the upper plate.

To facilitate rotation of the spherical member 14 when the attaching eye 16 is not accessible, a plurality of spaced notches are provided in the spherical member. It is then only necessary to place a finger or a tool in the notch to rotate the spherical member to position the attaching eye 16 as desired.

When the cargo securing device is exposed to the elements, it is possible that the spherical member 14 will be frozen in one position with respect to the upper and lower plates 10 and 12. To overcome this, a hole 46 is provided in the spherical member 14 for the full diameter thereof. Thus, it is a simple matter to position a tool within the hole 46 and use the leverage provided thereby to free the spherical member 14 from its frozen position.

With the structure described, it is apparent that the attaching eye may be utilized either above the deck or below the deck as the situation dictates and when the attaching eye is not in use, it may be pivoted below the deck out of the way so as not to obstruct the footing of the user.

In addition to the attaching eye 16, a second attaching eye 48 may be provided adjacent the opposite end of the elliptical shaped lower plate member 12 from the attaching eye 16. Thus, at the same time, the fixed attaching eye 48 may be in use beneath the deck while the attaching eye 16 may be pivoted for use above the deck.

While the supporting or mounting plates 10 and 12 have been shown as generally rectangular and elliptical in configuration, it is apparent that such may be formed as circular members. Furthermore, the spherical member 14 need not be entirely spherical but may have portions thereof truncated so long as a partial spherical surface is provided to guide rotational movement.

Many modifications may also be made with respect to the attaching eye 16. For example, the attaching means may consist of the combination of an attaching eye and an attaching elongated slot and the stem itself extending from the spherical member may be cocked with respect to the spherical member if so desired.

While only a single embodiment of this invention has been shown and described, it is apparent that there may be many changes in structure and operation without departing from the scope of this invention as defined by the appended claims.

What is claimed is:
1. In a securing device adapted for use with a space separating structure having an aperture therein the combination comprising
   a. a member adapted for universal pivotal movement (having attaching means thereon);
   b. means adapted to be secured in the aperture of said space separating structure and mounting said member for universal pivotal movement while retaining the same; (i) said mounting means having an opening therein;
   c. attaching means extending from said pivotal member and movable through said opening (through which said attaching means is movable) whereby said attaching means is adapted for universal pivotal movement on both sides of the space separating structure.
2. The securing device of claim 1 wherein said opening is generally rectangular in configuration and said attaching means is dimensioned so that in one pivoted position the attaching means will move through said opening while in other pivoted positions of said attaching means the attaching means will not be able to move through said opening.
3. The securing device of claim 1 wherein said mounting means forms a socket partially enclosing said member and said opening in the mounting means is in registry with said socket.
4. The securing device of claim 3 wherein said member is of generally spherical configuration and slidingly cooperates with said socket with said attaching means extending outwardly from one side of said spherical member.
5. The securing device of claim 1 wherein said means mounting said member comprises a pair of plates secured together and each having a generally circular opening therein with said attaching means opening in registry therewith.
6. The securing device of claim 5 wherein one of said plates has a raised portion of a thickness substantially similar to the thickness of the space separating struc-
5. The securing device of claim 1 wherein said mounting means comprises a pair of plates each having a generally circular opening therein and a slot in registry with and extending from said circular openings, and said member being of generally spherical configuration with the diameter larger than the diameter of said circular openings, said pair of plates being secured together with said (said) spherical member therebetween and said slots in alignment whereby said attaching means is adapted for universal pivotal movement on one side of said space separating structure and may be moved through said aligned slots for universal pivotal movement on the opposite side of said space separating structure.

8. The securing device of claim 7 wherein at least one of said plates is provided with a partial spherical surface adjacent said circular opening and of a curvature substantially similar to the curvature of said spherical member to provide a seat for said spherical member and to guide universal pivotal movement thereof.

9. The securing device of claim 7 wherein said spherical member is provided with spaced notches on the surface thereof to aid grasping the spherical member to affect pivotal movement thereof.

10. The securing device of claim 7 wherein a hole is provided through said spherical member across the diameter thereof to accommodate a tool which may be used to affect pivotal movement of said spherical member.

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