SELF ALIGNING LATCHING MECHANISM ON A CARGO CONTAINER SPREADER

Abstract

A self aligning latching mechanism on a cargo container spreader, the mechanism mounted so as to surround a post of the spreader and including biasing means to normally keep the post substantially vertical whilst allowing the post limited movement upwardly against the action of the biasing means to a position where its longitudinal axis can be displaced to a slight angle to the vertical. The mechanism serves to allow the spreader to be connected to a container which has one or more of its recesses out of alignment.

1 Claim, 4 Drawing Figures
SELF ALIGNING LATCHING MECHANISM ON A CARGO CONTAINER SPREADER

Cargo containers are lifted individually or in groups of two or more, from one carrier or support to another, by hoisting equipment which includes a horizontal flat frame like implement suspended from a crane by a cable-pulley system and adapted to be connected with the container at a number of points along its top. Such implements are commonly known as spreaders.

Such spreaders are generally rectangular in plan, the spreaders being provided with a number of downwardly projecting spaced posts arranged to fit into correspondingly spaced recesses on the top of the cargo containers. The spreader is further provided with means for rotating the posts when such posts are located in the recesses on the container, the posts being adapted to lock the spreader to the container when rotated in the recesses. Such a spreader will hereinafter be referred to as a spreader of the kind specified.

Containers, however, are subject to damage in transit, and the recesses, as a result may become misaligned. Also containers in the cells of the holds of ships may not be properly located therein for one reason or another. In such instances the posts of the spreaders may not locate in their corresponding recesses in the containers, and accordingly, the containers cannot be lifted.

It is therefore an object of the present invention to provide a self aligning latching mechanism on a spreader which will enable the spreader to be coupled to the container even though one or more of the recesses of the container may be out of alignment.

Accordingly, the present invention resides in a cargo container spreader of the kind specified, wherein each post is mounted on the spreader so as to be capable of limited movement upwardly against the action of a spring means from a position where its longitudinal axis is normally vertical to a position where its longitudinal axis can be displaced to a slight angle to the vertical.

In order, however, that the invention may be better understood, it will now be described with reference to the accompanying drawings, but it will be appreciated that the invention is not intended to be limited to the particular embodiment shown therein.

In the drawings:

FIG. 1 is a plan view partly in section of a spreader;
FIG. 2 is an elevation partly in section showing one of the posts in its normal operating position;
FIG. 3 is a plan view of the post shown in FIG. 2, and
FIG. 4 is an elevation partly in section showing a post of the present invention picking up on the corner of a container which is misaligned.

In the embodiment as shown in the drawings, the spreader is seen to be substantially rectangular when viewed in plan and is formed of an open framework composed of metal side members 11 of suitable cross section brazed by diagonal members 12, each corner of the framework being provided with a downwardly projecting post 13, the lower end of each of the posts being adapted to be located in recesses formed in castings at the corners of the top surface of a cargo container.

The lower ends of the posts are fitted with latching means 15 which upon rotation or twisting of the posts 13 about their longitudinal axis, cooperate with the recesses in the corners of the container to attach the spreader to the container. Such latching means are of conventional construction and consequently no further description of this feature is considered necessary. Rotation of the posts is effected by actuation of a hydraulic ram 16 which has each of its piston rods 17 connected to one end of a connecting rod 18, the other end of which is adapted to be connected to the post 13.

The posts 13, in this embodiment, are each provided at their upper ends with a cranked lever 19, which is connected to the connecting rod 18 in such a manner that operation of the hydraulic ram 16 results in limited rotation or twisting of the posts 13.

Each post 13 is located in a mounting box 20 at the corner of the spreader, the post 13 being positioned within a casing 21 so that the post may rotate with respect to the casing 21 but not otherwise move with respect to the casing. The lower end of the casing 21 is provided with a bearing surface 22, through which the lower end of the post 13 and the latching means 15 project, the lower end of the casing 21 passing out through the base plate 23 of the mounting box 20. The portion of the casing 21 which passes through the base plate 23 is provided with downwardly convergent surfaces 24, the periphery of the opening in the base plate 23 being shaped to complement the convergent surfaces 24. The upper end of the casing 21 passes through a collar 25 fixed in the mounting box 20, the inner face of the collar 25 being internally radused to give minimum sideways movement at this point. The collar 25 is provided with pins 26 which locate in slots 27 in the upper end of the casing 21 to prevent the casing 21 from rotating the mounting box 20. The casing 21 is however capable of sliding movement within the collar 25 and is biased by spring means 28 to assume the position shown in FIG. 2 of the drawing in which the post 13 is held substantially vertical. Upward movement of the casing 21 against the action of the spring 28 results in the post 13 moving to a position where its longitudinal axis can be displaced to a slight angle to the vertical, which provides therefore for lateral movement of the latching means 15 to allow the posts to enter into a misaligned recess R on the container as seen best in FIG. 4. The vertical movement of the bearing surface 22 allows each of the latching means 15 to adjust to its corresponding container recess where the recess is not in the same horizontal plane as its complementary recesses.

In the embodiment shown in the drawings, each of the posts 13 has a safety interlock associated therewith. The safety interlock comprises in this embodiment, a cam plate 30 mounted adjacent the upper end of each post 13, immediately below the cranked lever 19, for rotation with the post, and a sensing rod 31 located adjacent each post and substantially parallel thereto. The rod 31 does not extend downwardly as far as the post 13. Each sensing rod 31 is arranged for sliding movement in a direction substantially parallel to the longitudinal axis of its associated post 13 between a lower locking position and an upper released position, by means of a helical metal spring 32 surrounding the rod 31 and bearing against a bearing surface 33 thereof. In this embodiment the upper end of the rod 31 is provided with an enlarged portion 34 which is arranged so as to co-operate with the cam plate 30 to prevent rotation of the post 13 when the rod is in the locking position.

In the released position, the enlarged portion 34 of the sensing rod 31 is moved clear of the cam plate 30, against the action of the helical spring 32, to allow the cam plate 30 to move past. The length of the sensing rod 31 is so chosen that when its associated post is located in its recess R in the cargo container, and at least substantially all the weight of the spreader is carried by the container, the rod 31 contacts the container so as to be forced against the action of the helical spring 32 to move to its released position. The sensing rod moves back to its locked position when substantially all the weight of the spreader is removed from the container.

If desired not all the posts 13 need be supplied with safety interlocks. For example, in the case of a spreader having four downwardly projecting posts, at least two posts which are located diagonally opposite each other should be fitted with such interlocks.

With the above described interlocks fitted, the unlocking or releasing of the posts to allow rotation thereof, cannot be achieved unless the posts are correctly located in the recess of the cargo container and also the weight of the spreader is being carried by the container. Thus when a container is suspended beneath a spreader, that is, when the weight of the spreader is removed from the container, the posts are held locked against rotation thus preventing any accidental release of a suspended container.
The above described construction also allows a spreader to be coupled to a container even though one or more of the recesses of the container may be out of alignment due to damage, for example.

I claim:

1. A cargo container spreader connectable to a container having top recesses comprising a spreader frame, a plurality of posts each having latching means insertable in and engageable with one of said container recesses, means supporting each post on said frame consisting of a mounting box attached to said frame and having a bottom opening with a convergent wall, a casing slideably mounted in said mounting box and having a longitudinal bore and a portion extending through said bottom opening which portion is of a configuration to compliment said bottom opening, a collar mounted within said mounting box, having a bore with said casing slideably extending therethrough and said collar bore being internally radius to allow the longitudinal axis of said casing to be displaced at a slight angle to the axis of said collar bore, resilient means tending to hold said casing with its longitudinal axis substantially normal to said frame and said casing portion adjacent said bottom opening, one of said posts extending through, and rotatable in said casing bore, means retaining said one of said posts from longitudinal movement in said casing bore and means for rotating said one of said posts when its latching means is engaging one of said container recesses.

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